Prediction of student achievement on Missouri Assessment Program be predicted from Aimsweb MAZE scores?

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ABSTRACT

The research was completed to see if the time spent raising test scores on the MAZE assessment from Aimsweb was worth the effort when trying to raise student achievement scores on the Missouri MAP test. When trying to meet AYP for a school building and a district in order to keep and receive state accreditation schools spend a lot of time and money on programs and resources that will best help their students. The Aimsweb MAZE assessment is said to determine student comprehension, but this study looked to see if those test scores had any correlation to predicting what students would achieve on the Missouri MAP. A single step regression analysis on Aimsweb MAZE scores and MAP scores. This study found that in one Missouri Elementary school, fourth grade, over a three year span, the Aimsweb MAZE results did in fact predict MAP achievement scores. Students who met the benchmark goals on the MAZE scored well on the MAP.
Introduction

Background, Issues and Concerns

The school district in which the data was collected is a medium sized district with 4 elementary schools of varying sizes. The particular school that was used has 2 sections of each grade level with approximately 23 students per classroom. The school and district are in their 7th year of RtI implementation, and their 6th year of using the following Aimsweb assessment to organize and collect data: MAZE. The data collected from Aimsweb assessments are the soul determinant used to consider a student for special education and is also used to determine those students who need extra reading help in order for them to achieve well on the MAP. Concerns that have arisen over this method include: how well it identifies students who need extra support, if it can help the school identify those students who need extra support and instruction to increase achievement on standardized tests, and also the cost to the district if it’s not a valuable tool.

Practice under Investigation

The Practice under investigation is using Aimsweb scores to determine RtI ability groups and student achievement levels on MAP tests.

School Policy to be Informed by Study/practice

School policy to be informed by this study is the purchase and maintaining of Aimsweb. Each school in the district uses Aimsweb at a high cost of purchase to each buildings budget each year. Districts and schools are under fire to increase annual AYP and keep their accreditation, if they can find a program which will help to increase and predict end of the year MAP scores, schools and districts will be better able to prepare for state standardized testing.


Conceptual Underpinning

All teachers care about the success of their students, and their achievement. Districts and schools are always looking for tools and resources to increase their students. The MAP test assesses comprehension skills through silent reading and the answering of questions. The Aimsweb MAZE assessment identifies comprehension through a silently read cloze passage. Students who read faster may have a greater probability of finishing the MAP test, if only because it is a timed test. Aimsweb is an online tool that is easy to use across a large district, and if directions are followed is not time consuming for the teacher to administer as all students are taking the MAZE at the same time. In theory if the MAZE assessment from Aimsweb can predict MAP score outcomes, then a closer investigation and study into raising MAZE scores will also increase MAP scores, and further increase the school and the districts AYP.

Statement of the Problem

The problem this study addresses is how a school and a district time and resources can best be spent to increase student achievement on standardized state testing, the MAP. If the MAZE does not predict MAP scores another method is needed to help identify students who are in need of interventions to raise achievement.

Purpose of the Study

The purpose of this study is to see if MAP scores can be predicted by the Aimsweb MAZE assessment.

Research Question

RQ#1: Is the Aimsweb MAZE assessment an accurate predictor of 4th grade MAP score results?
**Null Hypothesis**

The Aimsweb MAZE assessment is not an accurate predictor of 4th grade MAP scores.

**Anticipated Benefits of the Study**

Anticipated benefits of this study are the school district could better implement interventions and an RtI program if Aimsweb MAZE scores would predict MAP scores.

**Definition of Terms**

RtI- response to intervention, a tiered approach to identifying and providing support to students in addition to the regular classroom from scientifically researched based curriculum to accelerate learning.

MAZE- Cloze test, given for 3 minutes, students read a 150-400 word passage and are given three word choices every 7th word throughout the passage and are to circle the word that makes the most sense in that particular area.

MAP TEST- Missouri Standardized Test given each spring to all Missouri public schools, for this research the communication arts section is the focus. Students test over 2 sections, one timed and one untimed. Students read passages and answer questions over comprehension and language skills. Both multiple choice and short answer questions are evaluated.

DESE- Department of Elementary and Secondary Education

AYP- Annual Yearly Progress sets benchmark goals for schools and districts to show student progress.

INTERVENTIONS- programs or activities used to increase student skills and are used with in the RtI system for Tier 1, 2, or 3 students.
Summary

The purpose of this study was to see if MAP scores can be predicted by the Aimsweb MAZE assessment. Benefits of this study include the ability of the school to better implement interventions into an RtI program. A regression analysis was conducted to determine the predictive relationship between Aimsweb MAZE scores and MAP scores. If a predictive relationship is determined to be applicable RtI interventions can be implemented to improve student achievement on state standardized testing. In theory if the MAZE assessment from Aimsweb can predict MAP score outcomes, then raising MAZE scores throughout the school year will result in increased MAP scores, and an increase to the school and the districts AYP.
Review of Literature

Reading is one of the most important skills for students to have in life. Reading is the one skill that is used on a daily basis from reading labels, to road signs, to work material. Our purpose as teachers is not just for students to be able to read information, but to understand what they are reading. RtI is about data driven assessments and interventions to identify student needs. Each tier of the RtI model gains in intensity to benefit students and help identify disabilities. (Essential Components, 2010) Interventions can be provided in any area from academics to behaviors.

A school's funding and accreditation are currently tied to their students’ achievement on standardized testing. (NCLB, 2001) The result of this legislation is the need for schools to raise these scores each year. With less time and money schools need faster and easier ways to improve test scores. RtI programs have been purchased at many schools at an alarming rate (Rebora, 2010) and schools are now permitted to spend special education money on these resources to implement and monitor progress. Many schools are doing so without knowing if what they are purchasing is really helping end of year student achievement, the ultimate goal.

The MAZE is a silent reading assessment which is used by Aimsweb to determine reading comprehension, with no questions being asked. MAZE is also a silent reading comprehension assessment. Kragler (1995), shows us through his research that many times schools measure fluency by having students read aloud and then use that information to predict standardized test scores, which students are expected to read silently. Hale’s (2011a) research looked into silent reading fluency, and determined that silent vs. aloud does not hinder a student’s comprehension level. A beginning or struggling reader has however been found to comprehend better after reading passages out loud (Kragler, 1995). Prior’s research also support
that beginning and struggling readers have been found to comprehend better after reading passages out loud than silently. (Prior and Welling, 2001)

Several studies have been completed, looking into the prediction of standardized test scores, and better ways to increase student achievement. Many samples of MAZE assessments and oral reading assessments have been used, but Hale used the MAZE, silent reading, assessment from Aimsweb and found that it is more of a predictor of elementary scores than of middle school scores. (Hale et al., 2011b) Hale addresses the following, “A concern with silent reading comprehension measures is that there is not a definitive way to know whether a student can read fluently but is unable to comprehend the text or if the student is unable to comprehend the text because he/she is choosing not to read it.” (p.34-35) Ardoin and Christ (2009) agrees, educators should not just use one assessment as a primary outcome for student progress. While Aimsweb, and other companies and programs provide training (Edformation, Inc, 2010) school districts may not always be paying for and training, therefore invalidating or not getting consistent results. The above findings are in support of multiple techniques of determining reading comprehension because, “Without sensitive, valid, and reliable assessments, educators may be at risk for two errors: (1) failing to identify students in need of intervention and (2) not making the necessary changes to an intervention to increase its effectiveness” (Hale et al., 2011b, p. 34)

Mooney et al. (2008) also addresses the concern of a schools need to discover a formative assessment which will help schools raise scores and AYP. Mooney’s et al. (2008) concern comes from the time it takes for states to get results back to schools, and the lack of being able to use those scores to drive classroom instruction. This study looked at benchmark scores in fall, winter, and spring for first, second, and third graders. It was found that a students’ score of pass
Prediction of Student 9

or fail on the state standardized test could be predicted through oral reading fluency benchmarks throughout the year.

A study by Wiley and Deno (2005) looked at oral reading fluency, and then added the MAZE assessment to see if it added predictive power of standardized testing to the oral reading score. Researchers discovered that the MAZE provided significant variance to the oral reading when oral reading scores where entered first. Next, MAZE scores were entered, followed by oral reading scores. In this analysis it was discovered that oral reading did not provide a significant variance of standardized test scores. In the fifth grade the MAZE was the better predictor of standardized test scores. (Wiley and Deno, 2005). The idea of the MAZE being a better predictor is beneficial to classroom teachers as a MAZE assessment can be given to the entire class at the same time, where as the oral reading fluency must be given to each student individually taking more instructional time.

Wiley and Deno (2005) also address teacher concerns of students reading fluently, but not understanding what they read. “Students who read aloud more words correctly from text passages also performed better on the high stakes assessments that required text comprehension.” (p.212) This is an ongoing discussion that occurs in classrooms and teacher workrooms which the studies looked at here seem to dismiss, as reading fluency is a predictor of standardized test scores.

Pearce and Gayle studied oral reading fluency as a standardized test score predictor in 3rd, 4th, and 5th graders finding that oral reading is a “robust predictor of reading comprehension ability” (62) These results show that schools with limited monetary funds should not be concerned about predicted and raising their AYP, as oral reading fluency assessments are readily available.
Research Methods

Research Design

A regression analysis was conducted to determine the predictive relationship between Aimsweb MAZE scores and MAP scores. If a predictive relationship is determined to be applicable RtI interventions can be implemented to improve student achievement on state standardized testing. The dependent variable is 4th grade MAP scores. The independent variable is 4th grade MAZE scores.

Study Group Description

Fourth graders from one elementary school who were fourth graders in 2011-2012, 2012-2013, and in 2012-2104. All students have both Aimsweb MAZE and MAP scores for the corresponding school year. Of the total school population 34 percent of the population was free or reduced lunch, less than one percent of the 4th grade was black or Asian, and 2.5 percent of the population was Hispanic. This demographic data remained constant throughout all three years of the study. No data was used from any student qualifying for special education in any area of communication arts in this study.

Data Collection and Instrumentation

MAP data was collected from the Missouri Department of Education web page with access granted through the building principal. The MAP was given in two different settings on 2 different days. All students in the study took the assessment in their classroom and the test was administered by their classroom teacher. The MAZE assessments were given at 3 intervals throughout the school year, fall, winter, and sprint, to all students. The winter data was used for this particular research. Some students were assessed monthly or bi-monthly if they were in the bottom 25 or 10 percent of the class. The assessments were administered by the classroom
teacher in a whole class, classroom setting. MAZE data was collected from the Aimsweb webpage, from access granted by the classroom teachers and with permission of the building principal.

Statistical Analysis Methods

The statistical analysis method used to determine if MAP scores could be predicted from Aimsweb MAZE scores was the single step regression analysis.
Prediction of Student 12

Findings

**Simple Linear Regression Analysis (SLR) Research Question:** Is the Aimsweb MAZE assessment an accurate predictor of 4th grade MAP score results?

Table 1: Regression Analysis for Aimsweb MAZE

**Table 1: Regression Analysis for Aimsweb Maze vs. MAP scores**

<table>
<thead>
<tr>
<th>Source</th>
<th>Beta Coef.</th>
<th>R²</th>
<th>SEE</th>
<th>F</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>617.625</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MAZE</td>
<td>1.983</td>
<td>.239</td>
<td>22.19</td>
<td>35.724</td>
<td>2.65778E-8</td>
</tr>
</tbody>
</table>

Alpha = 0.25

As shown in Table 1, simple linear regression was calculated predicting students MAP scores based on their Aimsweb MAZE score. A significant regression equation was found (F (1, 114) = 35.724, p < 0.000), with an R² of 0.232. Students’ predicted MAP score is equal to 617.625 + 1.983 Aimsweb MAZE. Students’ average MAP increased 1.983 points for an increase of one Aimsweb MAZE score with an SEE of +/-22.19.

With R² accounting for 24% of the variance between the dependent and independent variable and the standard error of the estimate showing the study is accurate at +/- 22.19 points at 1 standard deviation. The model shows with both moderate power and accuracy that the MAP score cannot be predicted from the Aimsweb MAZE score.

An F score of 35.724, a low to mediocre value when compared to zero shows that there is a likely chance that a Type I error could be made if the null hypothesis was rejected. The p-value, at 2.65778E-8, shows with 100% accuracy that there is no type I error. Therefore, it can be concluded that the Null hypothesis can be rejected with great confidence.
Conditions: Confidence Limits = 95
Value for Aimsweb MAZE = 19
Forecast = 655.302
Lower = 610.692
Upper = 699.642

Looking at the simple linear regression model, it can be concluded that the null hypothesis was rejected. Aimsweb MAZE scores can predict MAP scores.

The model showed that 95 percent of the students will score between 610.692 and 699.642 on the MAP. Students with an Aimsweb MAZE score of 19 are forecasted or predicted to score 655.302 on the MAP.
Conclusions and Recommendations

In conclusion, 116 students from the same elementary classroom, who had the same teachers were studied during their fourth grade year. After analyzing all the data it was determined that the MAP scores could be predicted, giving the school information needed to provide resources and tools to those students who are not scoring at a proficient level.

This study was developed to closely evaluate whether or not Aimsweb MAZE scores could predict MAP scores. The sample in Table 1 included 116 students from the 2010-2011, 2011-2012, 2012-2013 school year. The regression analysis showed a 24% variance within the 2 variables and a SEE of +/- 22.19. Showing moderate power and accuracy. The null hypothesis, MAZE scores cannot predict MAP can be rejected as indicated by a p value of 2.65778E-8. A confidence limit of 95 shows MAP scores could fall between 610 and 699 with a forecast of 655. 655 results in a rating of basic from the Missouri Department of Elementary and Secondary Education Department.

MSIP 5 and AYP are pressures upon schools to increase MAP scores and student achievement. Knowing that the MAZE can predict state assessment scores gives schools a valuable tool in the toolbox to help identify those students who need Tier 1 and Tier 2 RtI interventions. It also shows schools that the monies they are spending, at a time when they are not fully funded, it beneficial to student achievement.

This study size just included 1 grade level, over a course of 3 years. Future testing and research could be expanded to track students and their achievement from third grade through 6th grade, or students from a broader sampling of schools. A second study would include looking at AR STAR test scores to see if it may be a more powerful and accurate predictor of MAP scores. Information to consider at the conclusion of this study is the MAP is changing. In 2015 the
MAP is predicted to be administered online, as well as the content itself changing with the implementation of Common Core and the Missouri Learning Standards.
References


Essential Components of RtI- A Closer Look at Response to Intervention(2010)

 Retrieved from:


