



**Marzano Research Laboratory**  
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## **Report on Professional Development**

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A Summary of Findings for Ten Teachers on  
Three Critical Commitments to School Reform

**Prepared by Marzano Research Laboratory**

for

Apache Elementary School  
Farmington, NM  
March, 2010



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## Introduction

During the 2009-2010 school year, teachers at Apache Elementary School participated in a series of professional development workshops on *Getting Serious about School Reform: Three Critical Commitments* conducted by Diane Paynter, a senior associate at Marzano Research Laboratory (MRL). These three critical commitments represent a serious commitment to reform (details can be found at [marzanoresearch.com](http://marzanoresearch.com)):

- Commitment 1: Develop a system of individual student feedback at the district, school, and classroom levels.
- Commitment 2: Ensure effective teaching in every classroom.
- Commitment 3: Build background knowledge for all students.

This report summarizes the findings for data provided to MRL by the school.

## Data

School administrators provided MRL with data from three sources:

- Percentage of students, proficient or advanced, on reading and mathematics for ten teachers at Apache (2009 state test data).
- Teachers were asked to take a test regarding their knowledge of the three critical commitments. The test was divided into five sections: Commitment 1 – Measurement Topics, Marzano Rubric, and Marzano Taxonomy; Commitment 2 – Art and Science of Teaching; and Commitment 3 – Six-Step Vocabulary Process. Teachers were placed into four categories based on their overall scores for each section (3.0, 2.5, 2.0, 0-1.5). (Note: because the fourth category represented a range of scores from 0 to 1.5, 1.5 was used as the score for this category.)
- Teachers were evaluated regarding their level of implementation on the three critical commitments (L, M, H-, H, H+).

## Findings

In order to examine whether state test proficiencies on reading and mathematics varied between levels of implementation, a scatter plot was created comparing the five levels of implementation (1-L, 2-M, 3-H-, 4-H, 5-H+) and the percentage of students, proficient or advanced, on reading and mathematics. Figure 1 depicts these comparisons.

**Figure 1: Scatter Plot for Level of Implementation and State Proficiency**

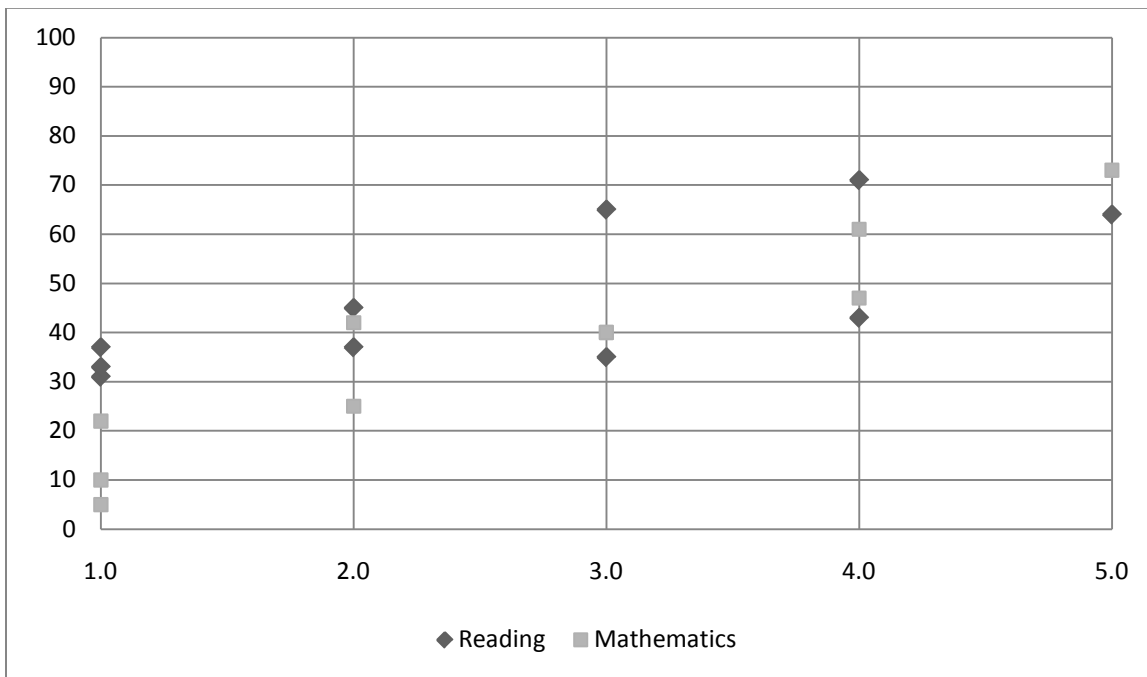
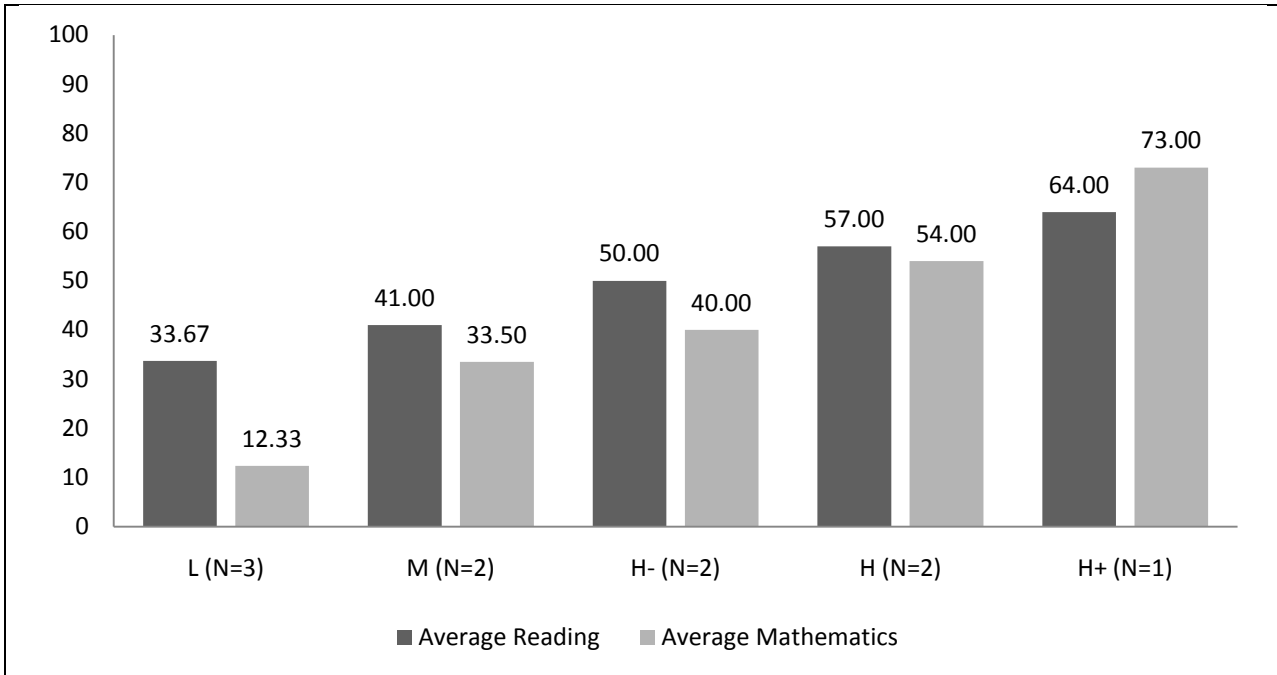


Figure 1 shows a linear relationship between implementation of the three critical commitments and the percentage of proficient or advanced students on the state test for reading and mathematics. This relationship is also evident when the percentages are averaged for each level of implementation. Figure 2 displays these averages (note: the number of teachers is reported in parentheses).

**Figure 2: Level of Implementation and Average of State Proficiency Percentages**



Figures 1 and 2 clearly show an increase in percentage of proficient or advanced students as the level of implementation on the three critical commitments increases. This indicates a correlation between implementation of the three critical commitments and percentage of proficient or advanced students on state tests for reading and mathematics. Figure 3 explores this correlation.

**Figure 3: Implementation and State Proficiency Correlations**

	Implementation
Reading	.743*
Mathematics	.939**

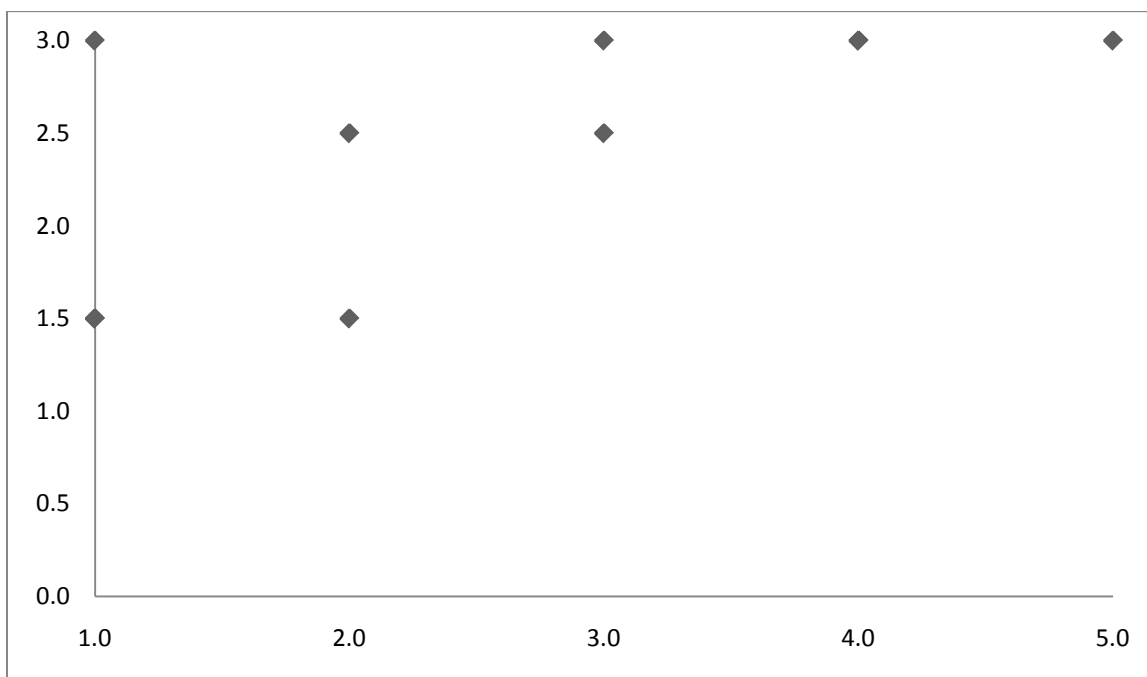
\* -  $p < .05$ ; \*\* -  $p < .01$

According to Lipsey and Wilson (1993), “A widely used convention for appraising the magnitude of effect sizes was established by Cohen (1977, 1988) in his book on statistical power. Cohen reported his general observation that, over a wide range of behavioral science research, standardized mean difference effect sizes fell into the following ranges: small –  $ES \leq .20$ , medium –  $ES = .50$ , and large –  $ES \geq .80$ . The analogous values for the correlation effect size are: small –  $r \leq .10$ , medium –  $r = .25$ , and large –  $r$

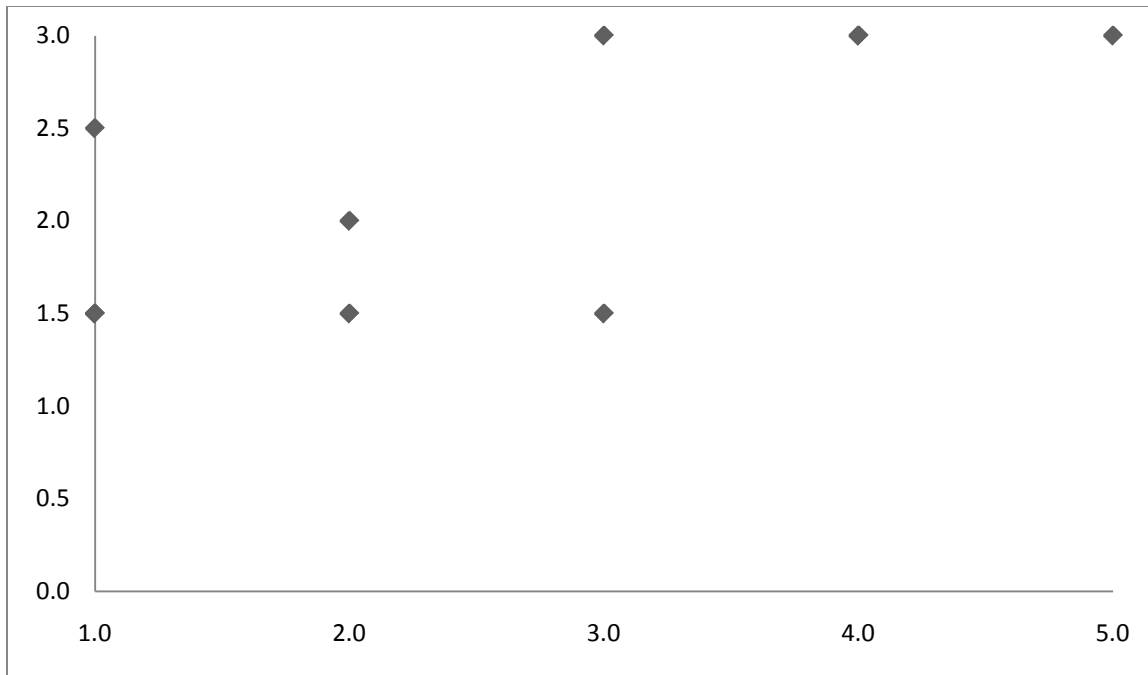
≥ .40” (p.147). Based on this criterion, the correlations between implementation of the three critical commitments and the percentage of proficient or advanced students on state tests for reading and mathematics would be considered very high. Additionally, the correlations are statistically significant at the .05 level ( $p < .05$ ) for reading and at the .01 level ( $p < .01$ ) for mathematics.

Again, teachers were asked to take a test regarding their knowledge of the three critical commitments. Teachers were placed into four categories based on their overall scores for each section (3.0, 2.5, 2.0, 0-1.5). (Note: because the fourth category represented a range of scores from 0 to 1.5, 1.5 was used as the score for this category.) The following figures display the scatter plots for each of the five sections for each level of implementation.

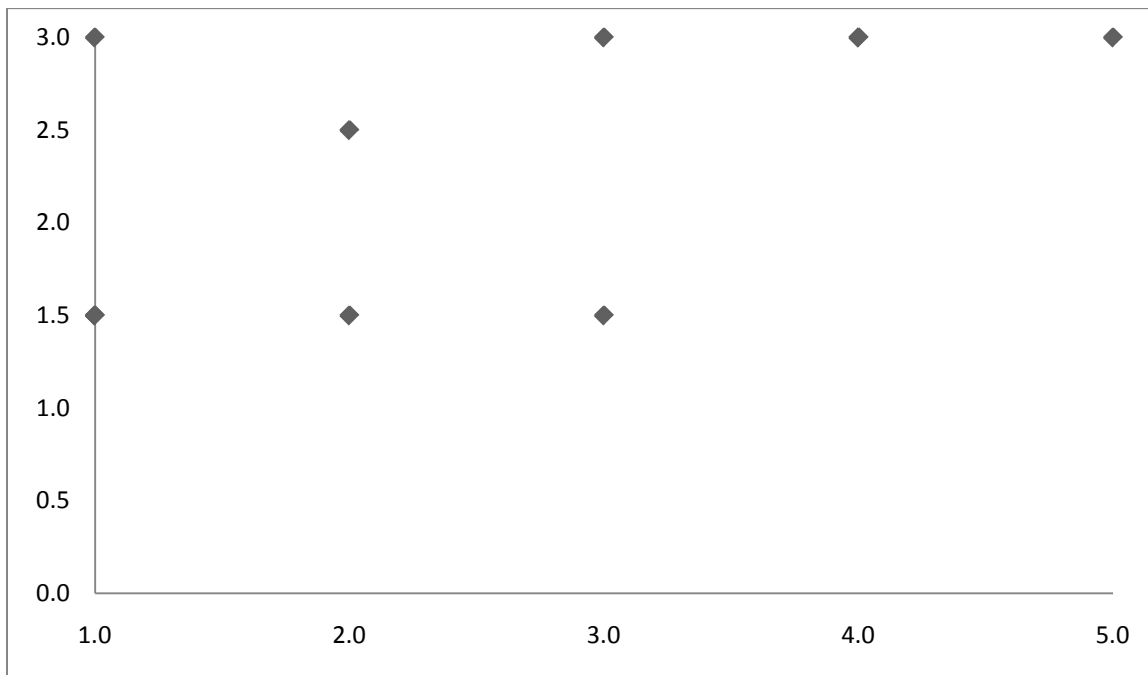
**Figure 5: Scatter Plot for Level of Implementation and Measurement Topics**



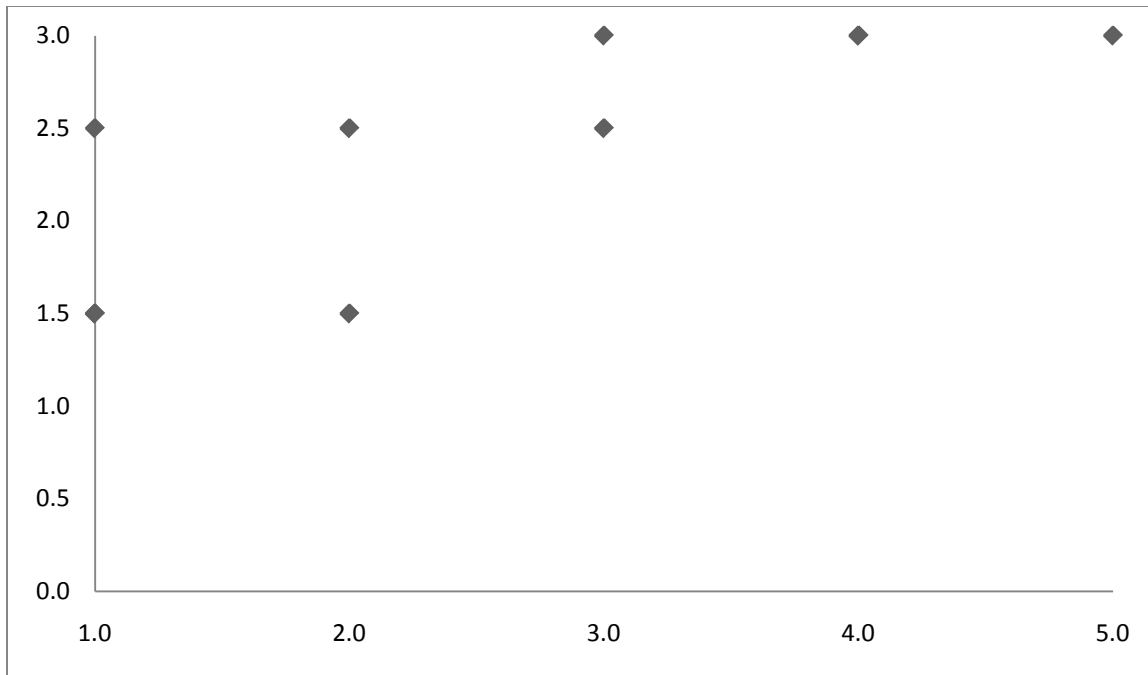
**Figure 6: Scatter Plot for Level of Implementation and Marzano Rubric**



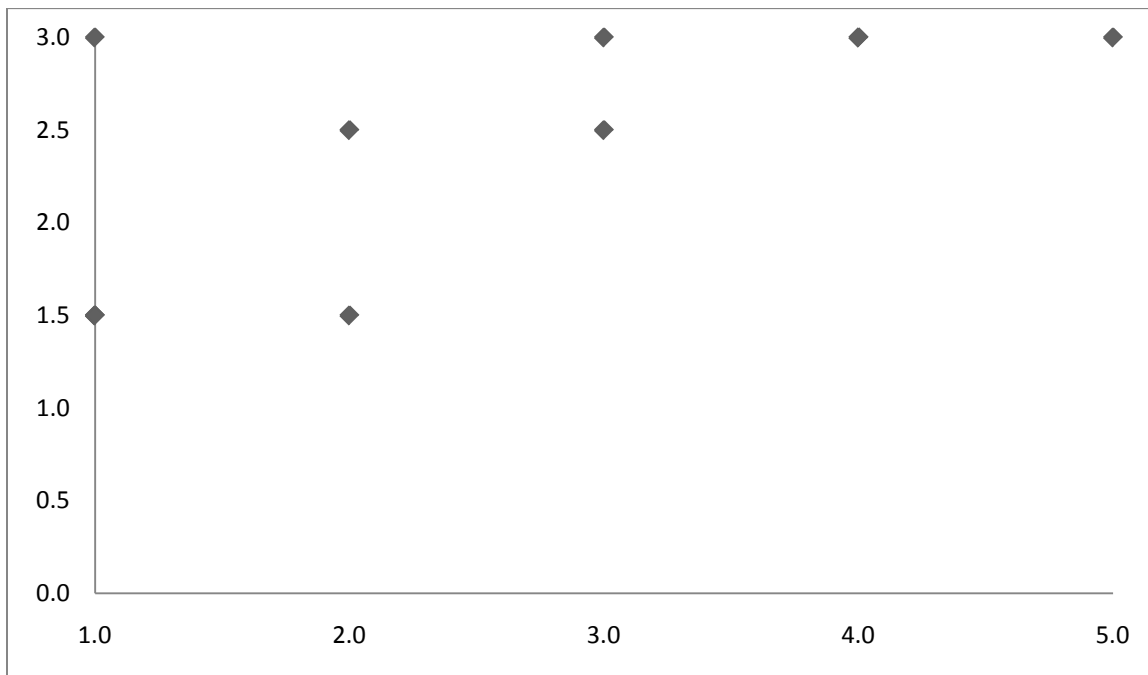
**Figure 7: Scatter Plot for Level of Implementation and Marzano Taxonomy**



**Figure 8: Scatter Plot for Level of Implementation and Art and Science of Teaching**



**Figure 9: Scatter Plot for Level of Implementation and Six-Step Vocabulary**



Figures 5 through 9 show that some of the teachers that were rated “L” and “M” on their implementation of the three critical commitments scored a 2.5 or higher on their knowledge of the three critical commitments. Teachers that were rated “H” and “H+” scored a 3.0 on all five sections of the three critical commitments test. Given the high scores on the three commitments test, what is the correlation between implementation and knowledge of the three critical commitments? Using the statistical software package PASW® Statistics (SPSS, 2009), a correlational analysis was employed between the level of implementation and scores on the three critical commitments test. Figure 10 displays these findings.

**Figure 10: Implementation and Three Critical Commitments Correlations**

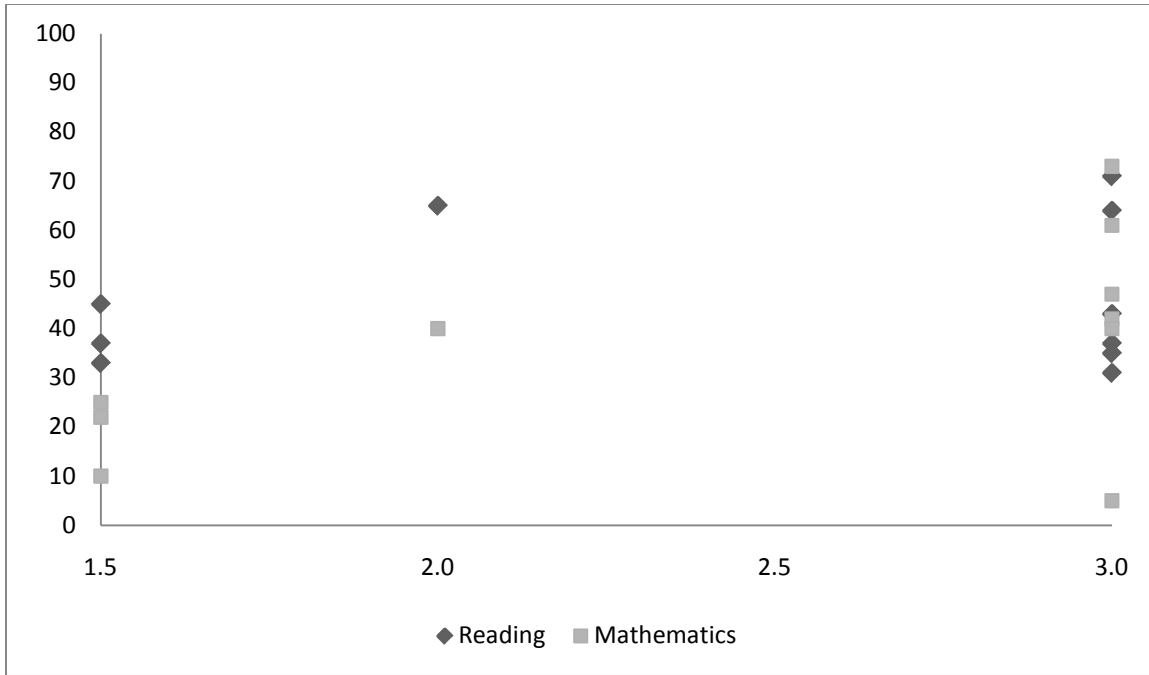
	Implementation
Measurement Topics	.568
Marzano Rubric	.705*
Marzano Taxonomy	.562
Art and Science of Teaching	.779**
Six-Step Vocabulary Process	.658*

\* -  $p < .05$ ; \*\* -  $p < .01$

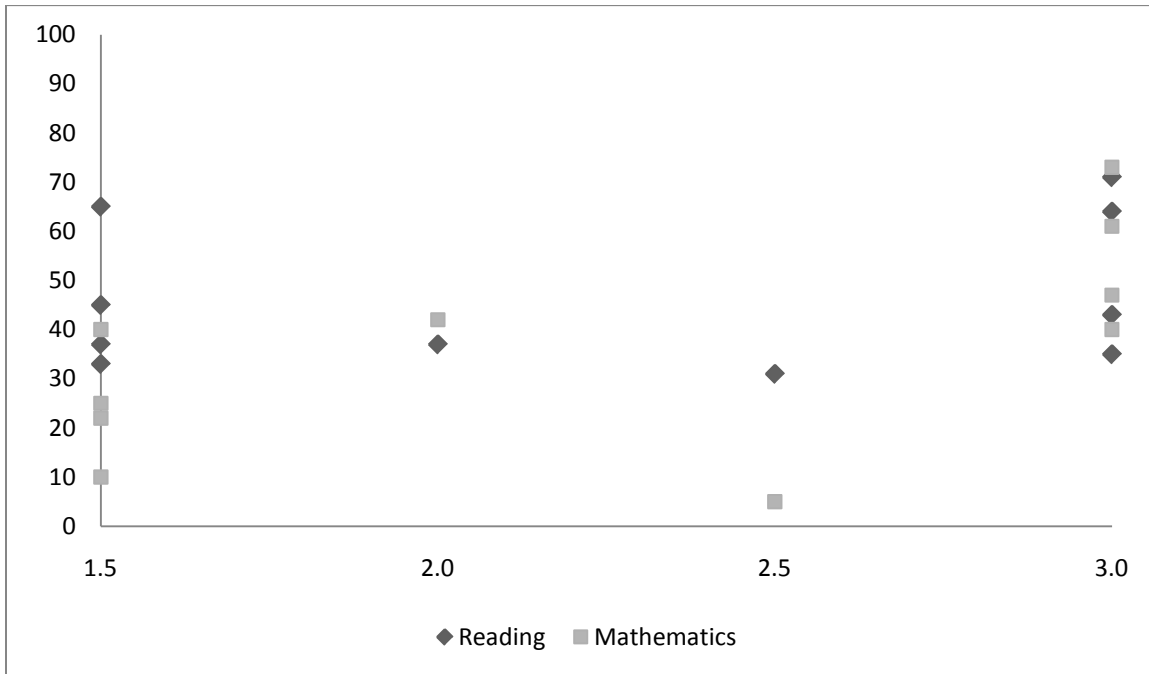
All of the correlations in Figure 10 are greater than .40 indicating a high correlation between knowledge and implementation of the three critical commitments. The correlations are statistically significant at the .05 level ( $p < .05$ ) for Marzano Rubric and Six-Step Vocabulary Process and at the .01 level ( $p < .01$ ) for Art and Science of Teaching.

The previous figures depict a linear relationship and high correlations between implementation and the percentage of proficient or advanced students on state tests for reading and mathematics and between implementation and scores on the three critical commitments test. In order to examine whether state test proficiencies on reading and mathematics varied between scoring categories on the three commitments test, a scatter plot was created comparing scores on the five sections of the three critical commitments test and the percentage of proficient or advanced students on state tests for reading and mathematics. Figures 11 through 15 display these comparisons.

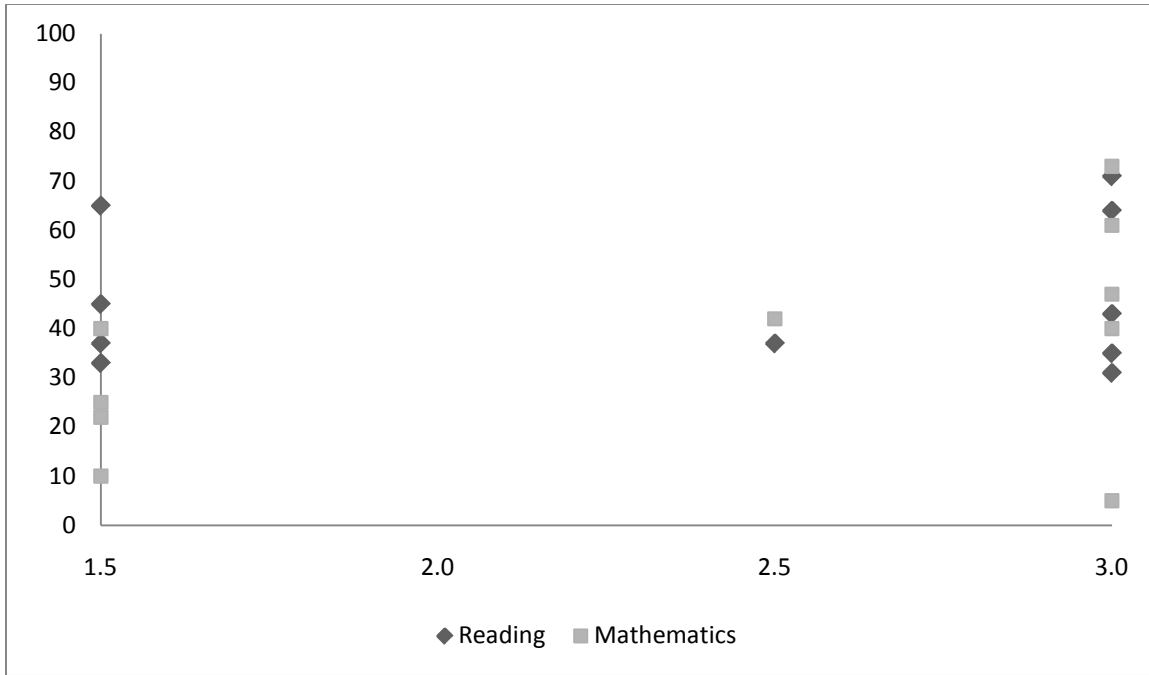
**Figure 11: Scatter Plot for Measurement Topics and State Proficiency**



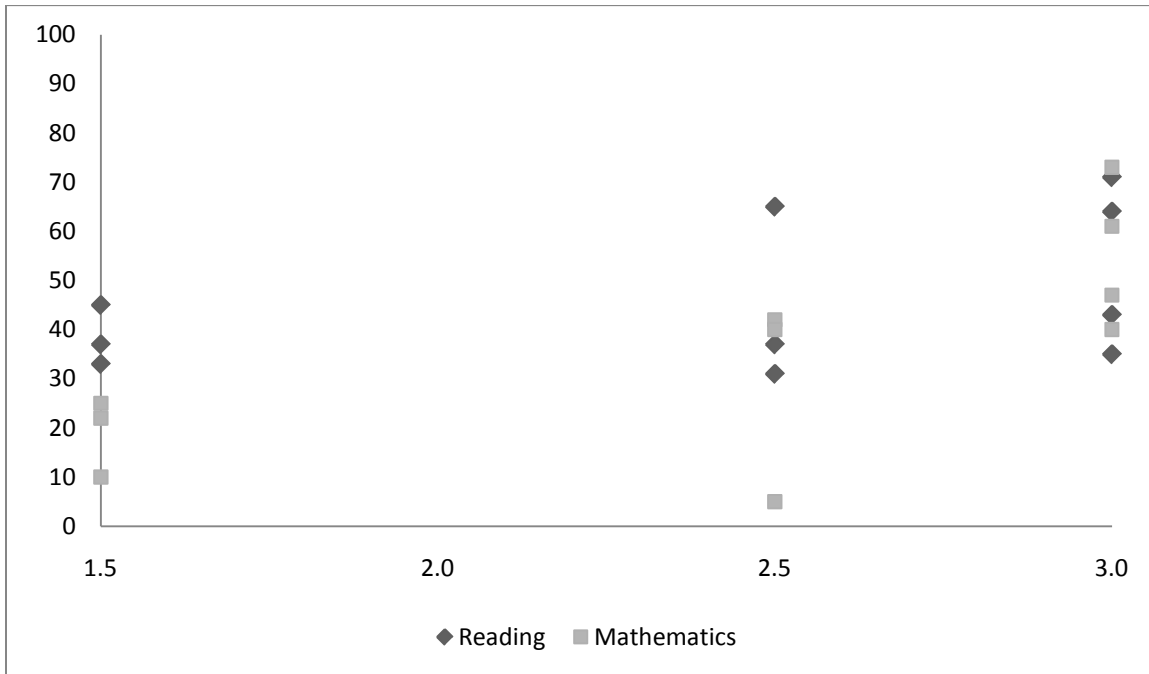
**Figure 12: Scatter Plot for Marzano Rubric and State Proficiency**



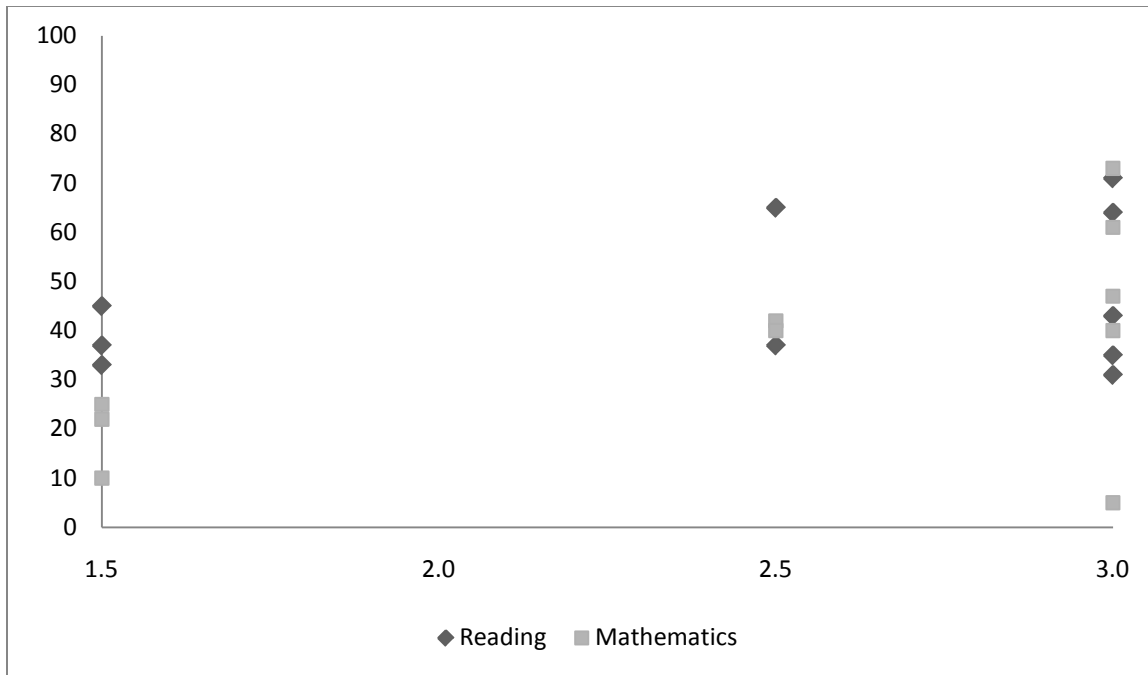
**Figure 13: Scatter Plot for Marzano Taxonomy and State Proficiency**



**Figure 14: Scatter Plot for Art and Science of Teaching and State Proficiency**



**Figure 15: Scatter Plot for Six-Step Vocabulary and State Proficiency**



Figures 11 through 15 show that most teachers with a score of 1.5 on the three commitments test had less than 40 percent proficient or advanced students on state tests for reading and mathematics. Also, most teachers with a score of 2.5 or higher on the test had more than 30 percent proficient or advanced students on state tests, with a few teachers having 50 percent or greater. Figure 16 explores the correlations between scores on each section of the three critical commitments test and the percentage of proficient or advanced students on state tests.

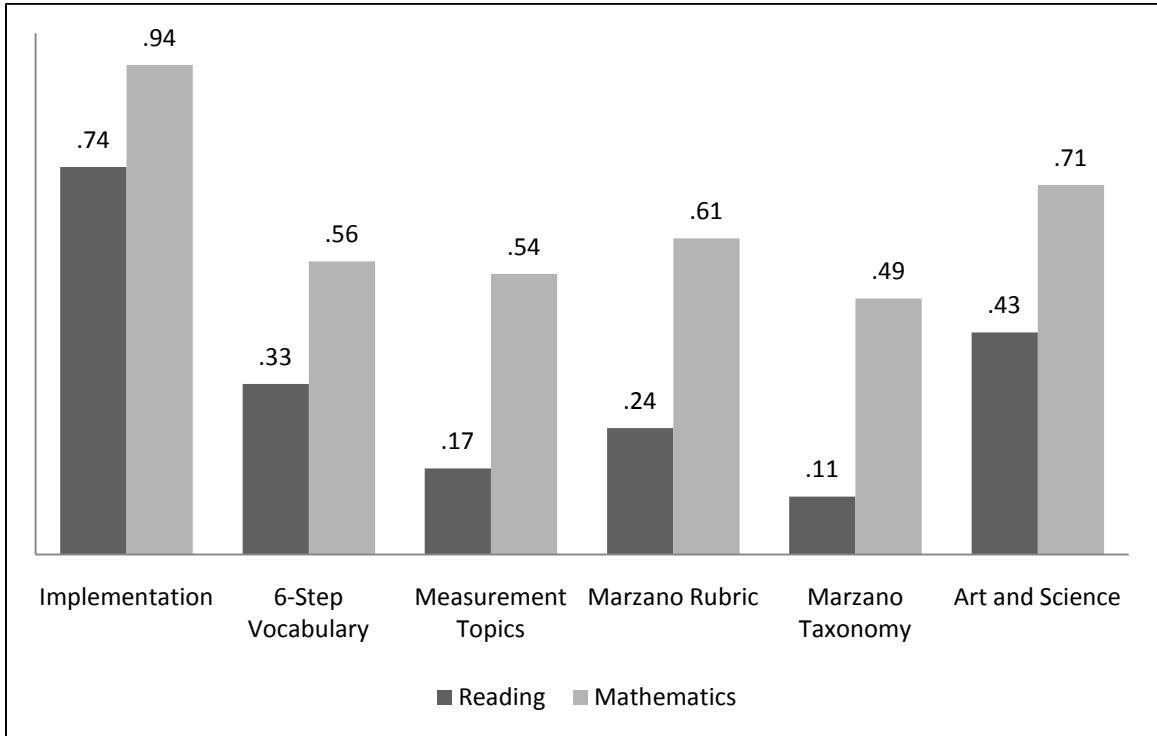
**Figure 16: Three Critical Commitments Test Scores and State Proficiency Correlations**

	Reading	Mathematics
Measurement Topics	.165	.538
Marzano Rubric	.242	.606
Marzano Taxonomy	.111	.491
Art and Science of Teaching	.426	.709*
Six-Step Vocabulary Process	.327	.562

\* -  $p < .05$

As depicted in Figure 16, one of the correlations between the three commitments test and reading and all of the correlations between the test and mathematics are greater than .40. This indicates a high correlation between knowledge of the three critical commitments and the percentage of proficient or advanced students on state tests for mathematics. The correlation for Art and Science of Teaching is statistically significant at the .05 level ( $p < .05$ ). For reading, there is a high correlation between knowledge of the Art and Science of Teaching and the percentage of proficient or advanced students on the state test. For comparison, Figure 17 displays the correlations in Figures 3 and 16 as a graph.

**Figure 17: State Proficiency Correlations**



## Summary

Data provided to MRL by Apache Elementary School suggests that a statistically significant large correlation exists between implementation of the three critical commitments and the percentage of proficient or advanced students on state tests for reading ( $r = .74, p < .05$ ) and mathematics ( $r = .94, p < .01$ ). Additionally, large correlations were found between implementation and knowledge of the three critical commitments. Finally, the correlations between knowledge of the three critical commitments and percentage of proficient or advanced students ranged from .49 to .61 for mathematics and from .11 to .43 for reading.

## References

Lipsey, M. W., & Wilson, D. B. (2001). *Practical meta-analysis*. Thousand Oaks, CA: SAGE Publications.

SPSS (2009). *PASW® Statistics* (Version 17.0.2) [computer software]. Chicago, IL: SPSS.