

Meta-Analysis of TargetTeach[®]
in the Areas of Mathematics and Reading
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In partnership with Arizona State University

Statistical consultation provided by

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Abstract

The alignment of standards, curriculum materials, and assessments to achieve maximum student performance has been well-documented in the research literature. TargetTeach[®] is a product and a process used by a number of districts that promises to assist districts with their alignment of standards, curriculum, and assessments. The goal is to raise student performance in diverse settings, with diverse student populations. A number of districts have used TargetTeach[®] over the years to increase student achievement in the areas of mathematics and reading. The purpose of this research study was to evaluate a sample of the schools' outcomes related to the implementation of TargetTeach[®].

The study used a meta-analytic approach whereby data from several studies were pooled to study group effects. Rather than looking at and summarizing the individual district data sets, results from pooling the varied sources could indicate that differences are less likely tied to specific, district-level characteristics and more likely to the treatment effect or TargetTeach[®].

The study results showed that student achievement after TargetTeach[®] implementation is associated with a statistically significant increase in passing scores for students on their state standardized test in mathematics and reading. This indicates that, aside from district-level variables associated with implementation, student demographics, or teacher characteristics, the TargetTeach[®] tools and process made a difference in increasing student achievement in both mathematics and in reading.

Purpose

Research has validated the importance of aligning standards, curriculum materials, and assessments to achieve maximum student performance. Bringing all the pieces together takes careful orchestration. For student success, careful alignment should help students achieve academically. Aligning curriculum, or linking objectives for the behavior to the instruction, then subsequently linking that to the assessment itself, allows researchers to better interpret assessment results in terms of student learning. Because aligned curriculum is tied to a set of standards rather than to a test, improvements then in the student standardized test scores are not results of the teacher teaching to the test but rather student learning.

Evans Newton Incorporated assists districts with their alignment of standards, curriculum, and assessments through its TargetTeach[®] process. The TargetTeach[®] process promises to raise student performance in diverse settings, with diverse student populations. The key elements include aligning a district's curriculum to state and local standards, filling any gaps in the instructional sequence, and implementing regular benchmark testing to guide instruction. Comprehensive staff development at all levels and monitoring tools for data driven decision-making complete the system.

A number of districts have used TargetTeach[®] over the years to increase student achievement in the areas of mathematics and reading. The purpose of this research study and others conducted by Arizona State University researchers is to evaluate the schools' outcomes or gather empirical evidence regarding the implementation, and possible success, of TargetTeach[®].

Methods

This study used a meta-analytic approach to examine the effects of TargetTeach[®] on student achievement. Hamer & Simpson (2002) state that meta-analysis is a set of statistical techniques for summarizing the results of several studies into a single estimate. Meta-analysis is also commonly used in quantitative literature reviews. Researchers will select a comprehensive collection of completed research findings on a particular finding and then compile the results in order to better describe the strength or evidence of effect.

In this study, the meta-analysis technique used combined studies of TargetTeach[®] impact from nine varied school districts in four states. The data were coded and transformed to a common metric (percent passing), so that the achievement outcome could be compared across studies. A chi-square test was used to measure the relationship between the study (implementation) and outcomes. This assessed whether there was any change over time: pre-post TargetTeach[®] implementation. If significant differences are found, it would be less likely that they are tied to specific, district-level characteristics that may have also been impacting student achievement and more likely that the change can be attributed to the treatment effect or TargetTeach[®].

Data Source

The districts data sets used are from nine districts: Assumption Parish and Lafayette Academy in Louisiana; Calumet Park, Danville, Hazel Crest, Joliet, and Zion in Illinois; Lansing, Michigan; and Tulsa, Oklahoma.

In Louisiana, student learning is measured with scores from three assessments, the *LEAP* for grades 4 and 8, the *iLEAP* for grades 3, 5, 6, and 7, and the *GEE* exam in grades 10 and 11. The five Illinois school districts' data consist of reading and mathematics scores on the Illinois Standards Achievement Test (ISAT). The Michigan scores are the Michigan Merit Exam (MME) results in math and reading from the state's high school standards test. The Tulsa data consist of reading and mathematics achievement data for 5th and 8th graders. The test used was the state's standardized achievement test: the Oklahoma Core Curriculum Tests (OCCT).

As can be seen, each data set uses state standardized test scores. Standardized tests are carefully designed for consistency of format, content, and administration procedure. The reliability of a standardized test is verified by statistical evidence gathered by the test publisher during pilot studies. A well-designed standardized test offers a relatively affordable and efficient way of measuring the achievement of a large number of students. When a high-stakes test must be selected to inform decisions that affect the future of a single student or an entire school district, standardized tests offer the best option for measuring levels of student achievement.

Measures

Dependent Variables

Analyses focused on proficiency level performance differences using two subgroups; namely, students who were *below standard* proficiency and those *at or above standard* proficiency. These levels were determined using each state's guidelines for achievement cut scores.

Independent Variables

The *Year* variable referred to the time variable with two levels: pre- and post-implementation of TargetTeach[®]. The study evaluated the difference between these years to see whether implementation of TargetTeach[®] made a difference. Each set of data includes other variables of interest, such as *gender, ethnicity, and Limited English Proficiency*; however, those variables were not included in this meta-analysis.

Participants

Table 1 and Table 2 below list the number of students in all nine districts that were in the districts and specifically in schools using TargetTeach[®], both before and after the implementation of TargetTeach[®] in reading and in mathematics.

Table 1: Available Student Population from 9 Districts (Reading)

	Frequency	Percent
Before TargetTeach [®]	8,912	52.8
After TargetTeach [®]	7,967	47.2
Total	16,879	100.0

Table 2: Available Student Population from 9 Districts (Mathematics)

	Frequency	Percent
Before TargetTeach [®]	8,686	51.5
After TargetTeach [®]	8,168	48.5
Total	16,854	100.0

A random sample (25%) was drawn from the pre-implementation and post-implementation students from across all districts. SPSS was used to select the random sample. The program uses an electronic equivalent of the table of random numbers to select the sample. This sampling plan helps to legitimate generalization from the results to the population of interest. By using a random sample in a pooled meta-analysis, researchers can speak with more confidence about the results and the intervention. Table 3 and Table 4 list the number of students after sampling.

Table 3: Random Sample of 25% of Students from 9 Districts (Reading)

	Frequency	Percent
Before TargetTeach®	2,206	52.8
After TargetTeach®	1,970	47.2
Total	4,176	100.0

Table 4: Random Sample of 25% of Students from 9 Districts (Mathematics)

	Frequency	Percent
Before TargetTeach®	2,194	51.9
After TargetTeach®	2,031	48.1
Total	4,225	100.0

Analysis/Results

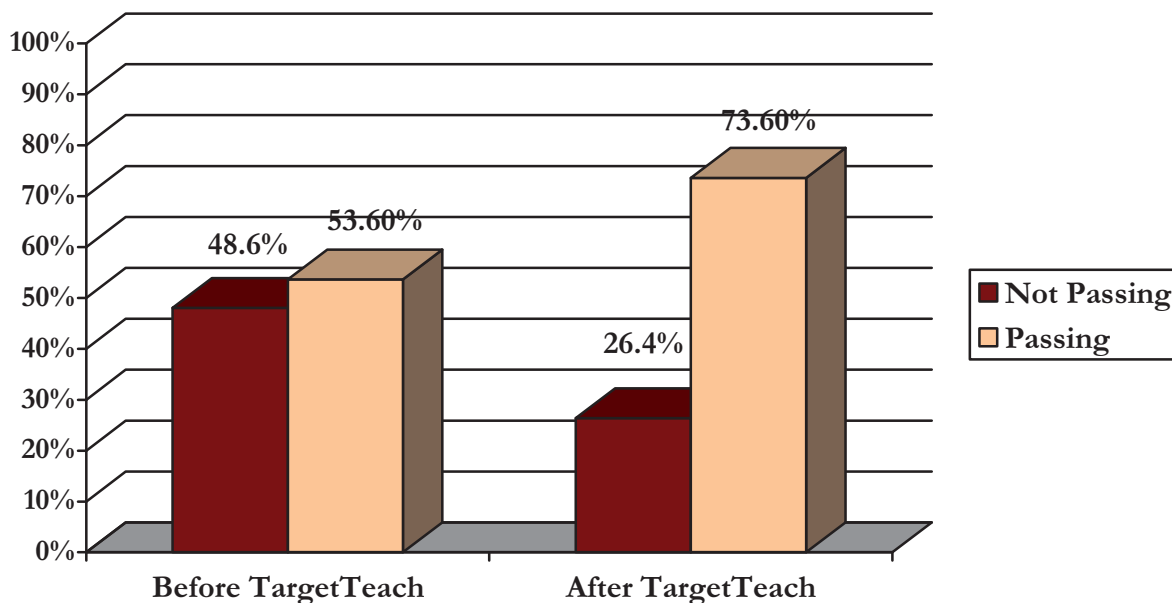
A chi-square test was used to examine change in the percent of students passing state tests at Proficient levels or above during pre and post implementation periods of TargetTeach®. In reading, participants were randomly sampled (25%) to 2,206 students before and 1,970 students after implementation. Approximately 51% of the random sample was above passing or proficient before the implementation of TargetTeach®. That percentage increased to 70% after the TargetTeach® implementation. This achievement differential, pre-post TargetTeach® implementation, was statistically significant in reading ($\chi^2(1) = 157.039, p < .001$). Table 5 shows the results of the numbers and percent of students passing the state standardized tests before and after TargetTeach® implementation.

Table 5: Results from Random Sample - Reading

		Below proficiency	Above Proficiency
	Count	1,072	1,134
Before TargetTeach®	% within Implementation of TargetTeach®	48.6%	51.4%
	Count	583	1,387
After TargetTeach®	% within Implementation of TargetTeach®	29.6%	70.4%

The chart below provides a graphical representation of the student achievement pattern. The chart displays the number of students at or above Passing/Proficient or below Passing/Proficient on the reading tests before and after TargetTeach®.

Student Passing Rates - Reading



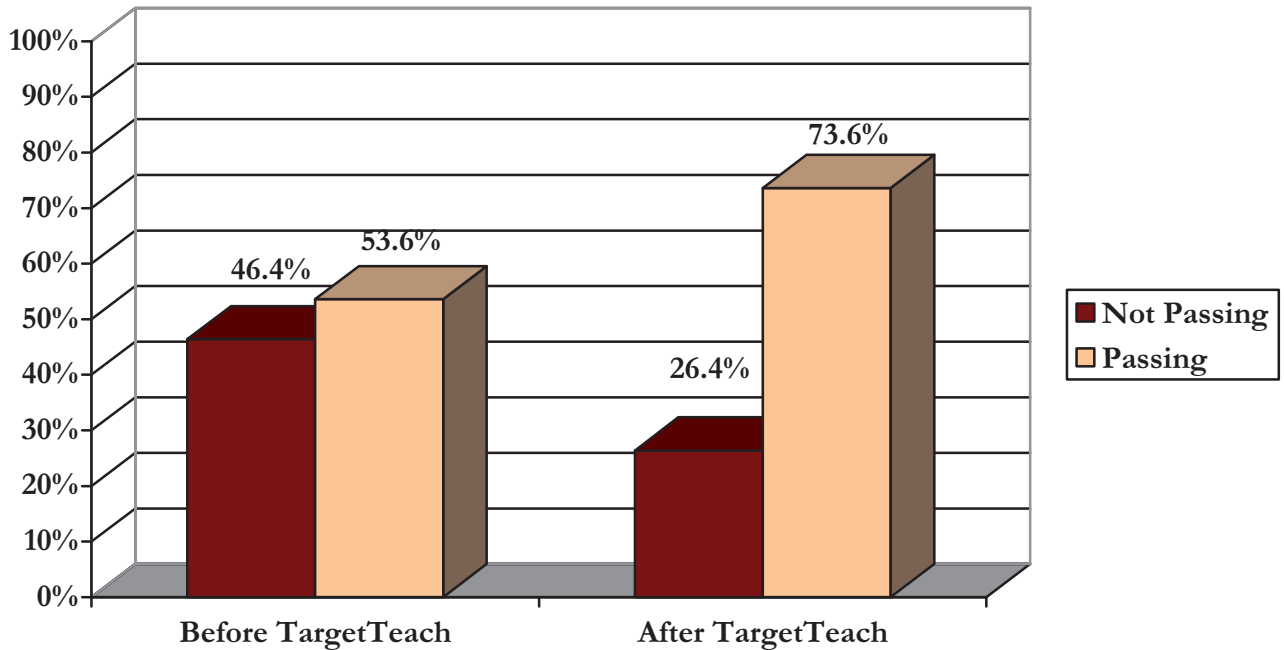
In mathematics a random sample of 2,194 before and 2,031 subjects after implementation was used. Approximately 54% of the random sample was above passing or proficient before the implementation of TargetTeach®. That percentage significantly increased to 74% after the TargetTeach® implementation ($\chi^2(1) = 181.417, p < .001$). Table 6 below shows the results of the numbers and percent of students passing the state standardized tests before and after TargetTeach® implementation.

Table 6: Results from Random sample – Mathematics

		Below Passing/Proficient	Above Passing/Proficient
	Count	1,019	1,175
Before TargetTeach®	% within Implementation of TargetTeach®	46.4%	53.6%
	Count	537	1,494
After TargetTeach®	% within Implementation of TargetTeach®	26.4%	73.6%

The chart below provides a graphical representation of the student achievement patterns in mathematics. The chart displays the number of students at or above Passing/Proficient or below Passing/Proficient on the mathematics tests before and after TargetTeach[®].

Student Passing Rates - Math



Summary

The meta-analysis examined the effect of TargetTeach[®] from a random sample of nine districts. This study shows that student achievement after TargetTeach[®] implementation is associated with a statistically significant increase in passing scores for students on their state standardized test in mathematics and reading. This indicates that, aside from district-level variables associated with implementation, student demographics, or teacher characteristics, the TargetTeach[®] tools made a difference in increasing student achievement.

References:

Hamer, R. M., Simpson, P. M. (2002). *SAS[®] Tools for Meta-Analysis*. [Electronic version]. Retrieved July 5, 2008, from <http://www2.sas.com/proceedings/sugi27/p250-27.pdf>