

Meta-Analysis of TargetTeach®
in the Areas of Mathematics and Reading

In partnership with Arizona State University

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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 was pooled to study group effects. Rather than looking at and summarizing the individual district data sets, results from pooling the four 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.

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 a result 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 particular study used a meta-analytic approach to examine the effects of TargetTeach on student achievement. Hammer & Simpson (2002) state that meta-analysis is a set of statistical techniques for summarizing the results of several studies into a single estimate. They contend that, statistically, the simplest and most straightforward meta-analysis can be completed if the

researcher has the data from several studies, which contain exactly the same treatments, administered under the same conditions, and there is a binary response variable.

Under such conditions, the individual studies can be integrated using techniques such as the Mantel-Hanszel statistic. This tests whether the response rate is the same for the two treatments, after adjusting for possible differences in study response rates. Another technique, and the one used for this study, is calculating chi-squared statistics for differences. Chi-square tests can also be used to estimate heterogeneity.

In this study, the meta-analysis uses individual-level data because the researcher has access to the raw data from each study. The meta-analysis used a “pooling” technique. Rather than looking at the district level data sets, the study drew upon data sets from four districts and then assessed whether there was any change over time: pre-post TargetTeach implementation. If significant differences are found, it is 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 Lorain City Public Schools (Ohio); Red Bank Borough School District (New Jersey); Zion Elementary School District (Illinois); and Tulsa Public Schools (Oklahoma).

In Lorain, student learning was measured with scores from the Ohio Proficiency Test (OPT) administered in mathematics and reading during the 4th and 6th grade. The OPT was the state mandated criterion referenced test that was being used at the time of the Lorain study to measure standards-based learning at various points in elementary and secondary education of Ohio students. For Red Bank, the study used Grade Eight (8th) Proficiency Assessment (GEPA)

scores for mathematics and reading. The Zion school's data consists of 8th grade reading and mathematics scores on the Illinois Standards Achievement Test (ISAT). The Tulsa data consists 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

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 four 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. The schools included from the districts were those that implemented TargetTeach. Tulsa, for instance, has over 80 schools, but only 25 of them were included in the initial implementation of TargetTeach.

Table 1: Available Student Population from 4 Districts (Reading)

	Frequency	Percent
Before TargetTeach	3,905	51.2
After TargetTeach	3,720	48.8
Total	7,625	100.0

Table 2: Available Student Population from 4 Districts (Mathematics)

	Frequency	Percent
Before TargetTeach	4,130	48.9
After TargetTeach	4,303	51.0
Total	8,433	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 whether or not the results are an effect with the variable that is the intervention. Table 3 and Table 4 list the number of students after sampling.

Table 3: Random Sample of 25% of Students from 4 Districts (Reading)

	Frequency	Percent
Before TargetTeach	979	50.6
After TargetTeach	954	49.4
Total	1,933	100.0

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

	Frequency	Percent
Before TargetTeach	1,054	49.5
After TargetTeach	1,076	50.5
Total	2,130	100.0

Analysis/Results

A chi-square test (cross-tabulation) 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 1,933 subjects. Approximately 37% of the random sample was above passing or proficient before the implementation of TargetTeach. That percentage increased to 52% after the TargetTeach implementation. This achievement differential, pre-post TargetTeach implementation was statistically significant in reading ($\chi^2(1) = 41.42, p < .001$). In mathematics a random sample of 2,130 subjects were used. Approximately 35% of the random sample was above passing or proficient before the implementation of TargetTeach. That percentage significantly increased to 65% after the TargetTeach implementation ($\chi^2(1) = 191.33, p < .001$).

Tables 5 and 6 below show 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

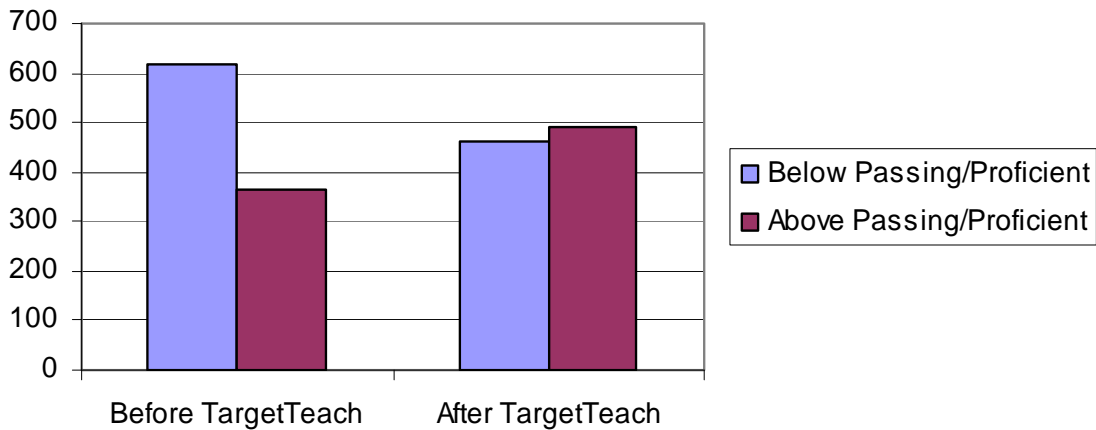
		Below Passing/Proficient	Above Passing/Proficient
	Count	615	364
Before TargetTeach	% within Implementation of TargetTeach	62.8%	37.2%
	Count	460	493
After TargetTeach	% within Implementation of TargetTeach	48.3%	51.7%

Table 6: Results from Random sample – Mathematics

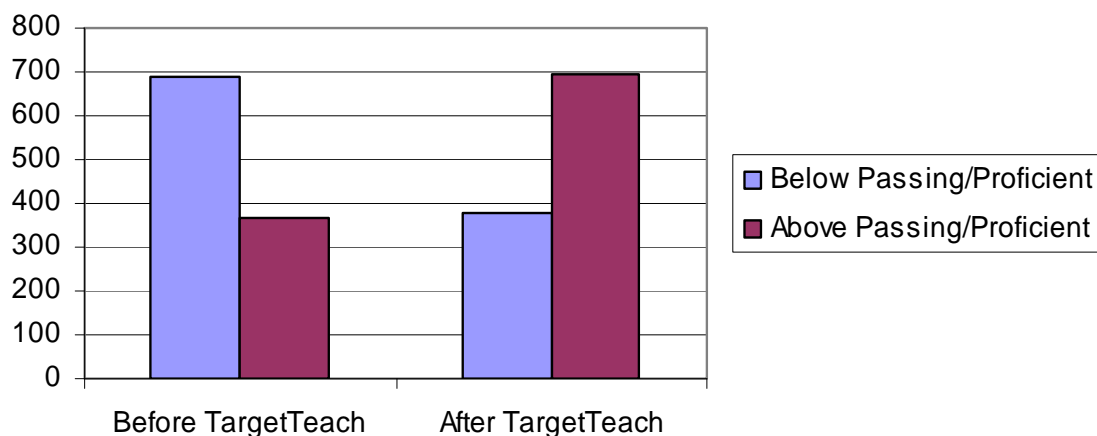
		Below Passing/Proficient	Above Passing/Proficient
	Count	687	367
Before TargetTeach	% within Implementation of TargetTeach	65.2%	34.8%
	Count	379	697
After TargetTeach	% within Implementation of TargetTeach	35.2%	64.8%

The charts below provide a graphical representation of the student achievement patterns. The charts compare the number of students at or above Passing/Proficient or below Passing/Proficient on the reading and mathematics tests before and after TargetTeach. The mathematics bars are nearly inversed.

Student Performance on Reading Assessment



Student Performance on Mathematics Assessment



Summary

The meta-analysis examined the effect of TargetTeach from a random sample of four 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>