USA District Like Mine (Low District Enrollment) Math Outcomes Analysis 2018/19

Grade Levels: 3, 4, 5
ST Math Program: Gen-5
Analysis Type: Z-score of math proficiency
Treatment-Years: 2018/19
Baseline-Year: 2012/13, 2013/14, 2014/15, 2015/16, 2016/17, or 2017/18
Subgroup: All

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Abstract

This analysis evaluates grades using ST Math with low district enrollment in the USA in 2018/19. It identifies those grades with nominal or better implementation of the ST Math program, and matches them to randomly selected, similar math-performance comparison grades. The nominal ST Math users are an aggregation of 70 grades, consisting of grades 3, 4, and 5 at 45 schools, with an average baseline z-score of 0.13. Refer to Figures 2 and 3 for the math performance and demographic distributions. They were matched to 70 similar, randomly selected control grades at 66 schools that never used ST Math. Grade-wise growth in math proficiency was evaluated (i.e. growth in same grade, same school, from Baseline to 2018/19) on the mean z-scores of percent Proficient or Advanced (see Section 3.1). Grades 3, 4, and 5 aggregated showed an ST Math effect of 0.4 z-score points.

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1 Introduction

1.1 Background

This is a quasi-experimental analysis at the grade-mean level. Entire grades represent the units of analysis, and outcome measures are the multi-year changes in grade-mean z-score of Proficient or Advanced. The treatment grades used the ST Math program for 1, 2, 3, 4, 5, or 6 years, beginning in the 2013/14, 2014/15, 2015/16, 2016/17, 2017/18, or 2018/19 school year, respectively. The study hypothesis is treatment grades using ST Math will outperform similar matched control grades, using their "business as usual" conditions of instructional content and professional development. The control grades were selected to have similar demographic and math attributes (See Figures 2 and 3) to the treatment grades during the baseline year (2012/13, 2013/14, 2014/15, 2015/16, 2016/17, or 2017/18), and did not use ST Math in 2018/19. The treatment grades' selection pool was all schools using ST Math with low district enrollment in grades 3, 4, and 5 in the USA. The control grades' pool was all schools not using ST Math in grades 3, 4, and 5 in the USA. This study method measures effectiveness of the ST Math program when nominally implemented.

1.2 Program Description

Spatial-Temporal Math (ST Math) is game-based, instructional software for K–12 students, created by the MIND Research Institute (MIND). The purpose of the program is to boost math comprehension through visual learning. The ST Math software games begin without language or symbol abstractions by posing math problems as purely visual puzzles. In this way, three objectives are accomplished: i) language proficiency prerequisites to engage with the program are minimal, ii) non-mathematical distractions (e.g. back-stories for word problems) are minimized or eliminated – thereby reducing load on working memory, and iii) the actual math in the problem can be represented clearly, simply, and unambiguously. Interactive, animated visual manipulatives provide informative feedback on student solutions. A score of 100 percent on a game level comprised of 4-12 puzzles is required for progression through the levels. Failure requires a re-play of the level, via a new quasi-random set of puzzles. In this way, progression is self-paced.

Besides the self-paced progress made by students in their one-to-one environment, the program is designed to be referenced by teachers during their regular math instruction. It is supplemental to core or basal math instruction and instructional materials. As the great majority of grade-level math standards are covered in the ST Math digital curriculum, completion of 100% of the entire ST Math curriculum (i.e. completing every Game) is required to cover all grade-level math standards. Teachers receive initial training, either face to face or through self-guided online instruction. The training covers account startup, as well as math learning and growth mindset goals, the pedagogical approach to learning in a visual experiential game, monitoring and intervention of the student 1:1 game play, and connecting of ST Math content to classroom content and pacing.

For students to achieve nominal progress through the program, there is a recommended time-on-task requirement of 90 minutes per week over about 30 weeks. Consistent application of 90 minutes per week throughout the school year is normally sufficient to result in a grade's average ST Math content coverage exceeding 50% by year-end. In this study, we include grades that have achieved 40% or more content coverage (Progress) by April 15th.

This is a passive study with no experimental setup or extraordinary communications to any schools. All schools in this study therefore received normal program implementation support through the year from MIND support managers. This support includes bundled startup services of approximately 2-4 hours of training either in-person or online, access to live webinars, regular online and push reports on

usage and progress, email/phone helpdesk, and proactive monitoring for gaps or issues by MIND support representatives.

MIND Research Institute initiated, funded, and exercised editorial control over this study.

2 Data Collection

Since this analysis uses grades as the unit of analysis, and states publish grade-mean state standardized test scores, the data for student math outcomes is collected from each state education agency's research files (retrieved from state websites). The treatment students use ST Math student accounts served by MIND. Student ST Math usage data is aggregated to grade-level means by MIND.

2.1 Treatment Grades Pool and Selection

The Treatment grades pool originated with all schools and grades using ST Math with low district enrollment in the USA. From these schools, every grade that had used the ST Math program only for the year 2018/19 was identified. They comprise the Treatment grades pool for this evaluation of multi-year usage.

2.1.1 Enrollment Filter

Because the analysis uses grade-mean data, such as grade-mean scale scores or grade-mean proficiency level percentages, it is necessary that the program also be a grade-wide treatment, with the great majority of students in each grade receiving treatment. Otherwise, the grade-means reported by the state of 100% of *tested* students would not be valid measures of a smaller fraction of *treatment* students. MIND's site implementation requirement is that an entire grade, including all teachers and all classes within that grade, use the ST Math program. We validate how closely this is the case for each individual treatment grade by comparing the number of ST Math student accounts at a grade level to the reported enrollment at that grade level. We discard from the Treatment pool any grade with a ratio of ST Math student accounts to reported grade enrollment lower than 85%.

2.1.2 Content Coverage Filter

Furthermore, the outcomes measure is a summative year-end test, i.e. the standardized math assessment of that state. The math assessment thus covers all the math standards for that entire grade level. Meanwhile, the ST Math program curriculum (arranged into Learning Objectives) is also aligned to each state's math standards. To infer that the ST Math content is having a valid effect on student outcomes on the summative assessment, we discard any grade with grade-mean of ST Math Progress for its students lower than 40% by April.

Progress is a percentage, and is defined as Levels completed by the student, divided by the total number of Levels in the grade-level curriculum. Note that student achievement of at least 40% progress in ST Math is accomplished primarily by teacher assignment of computer session time to students. With sufficient time on task, students make progress. The program helps them self-pace through providing real-time informative feedback for each puzzle.

2.2 Control Grades Pool and Selection

The control grades are randomly selected from a control pool of schools in the USA. Though they are randomly selected, they are also matched to be similar to the Treatment grades' math attributes and demographics during the baseline Baseline year. The matched attributes include:

- grade-mean z-score of percent Proficient or Advanced
- percentage of students receiving free or reduced lunch at the school-level (using the demographic data from MDR).

The method of matching used is propensity score matching, via the "matchit" program in R, with "mahalanobis" as the distance measure.

3 Data Analysis

The set of all schools and grades using ST Math with low district enrollment in the USA is evaluated for Enrollment percentage and Progress percentage parameters. A filtered Treatment set (TRT) of all ST Math grades with $\geq$ 85% Enrollment and $\geq$ 40% Progress is identified. State math assessment data is tabulated. A matching set of Control grades based on baseline year state math assessment is selected.

Changes in math performance, i.e. the difference in math performance of a grade from a baseline year to the final year, are evaluated and tabulated. Statistical tests of the significance of the difference in math performance changes between Treatment grades and Control grades are performed. Finally, a grade-by-grade disaggregation is performed.

3.1 Z-scores

In order to analyze across all states with different math assessments, a new z-score of that test's math proficiency is calculated. For each year being analyzed, by grade, a z-score takes the difference of the grade mean percent proficient and the mean of all percent proficient statewide for that year, and then divides it by the standard deviation of all percent proficient statewide for that year. Here is a fictional example to illustrate the calculation of a z-score for the 2015/16 exam:

School A, Grade 3, Percent Proficient: 70
Average across all schools statewide, Grade 3: 50
Standard deviation across all schools statewide, Grade 3: 20
Z-score=((School A, Grade 3, Percent Proficient)-(Average across all schools, Grade 3))/(Standard deviation across all schools, Grade 3)

$$\text{Z-score}=\frac{70-50}{20}=1$$

The z-score is calculated for every grade across all years being analyzed, using the full state data set of schools for the averages and standard deviations. The use of z-scores is a valid statistical method to normalize any dataset and to enable analysis across otherwise uncomparable exams. In this report, we only analyze z-scores.

3.2 Percentile Ranking

These newly calculated z-scores can then be converted into a percentile ranking. Each percentile ranking shows the grade's performance relative to the others in that year and grade. For example, for a specific grade 3, a percentile ranking of 50 shows that this grade 3 performed at the average of all third grades in the state for that testing year.

3.3 Final Treatment and Control

3.3.1 ST Math Grade-Aggregated Implementation ($\geq$ 85% Enrollment Grades Only)

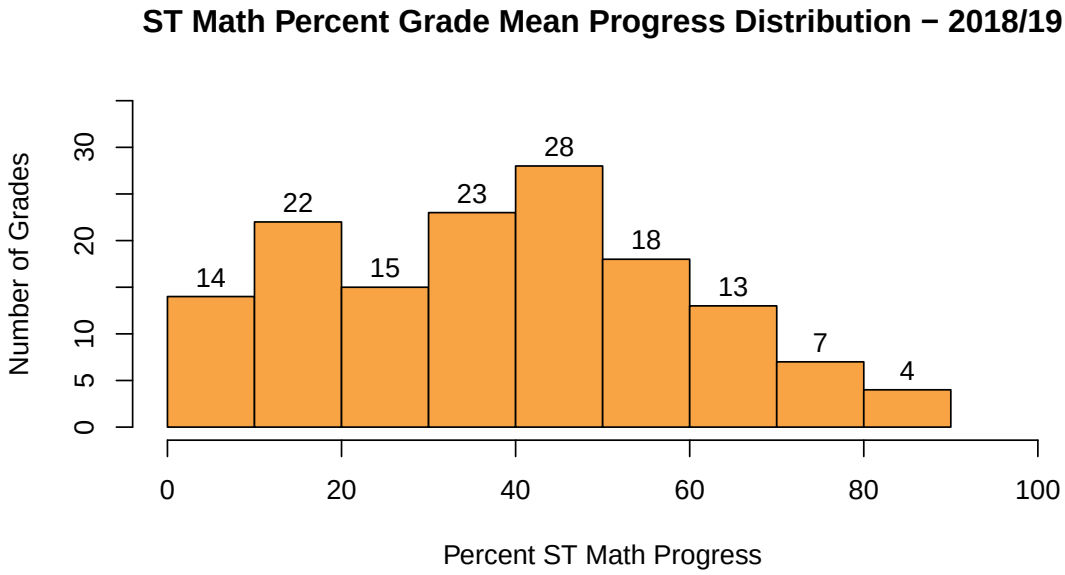

Figure 1: Histogram of ST Math Percent Progress for $\geq$ 85% Enrollment Grades 2018/19

For all ST Math grades with Enrollment $\geq$ 85%, Figure 1 shows the frequency distribution of grade-average Progress percentage through the program. Note that we will only be using grades with $\geq$ 40% Progress as the Treatment Group.

Table 1 provides descriptive statistics of the Progress distribution. Table 2 shows the number of remaining treatment grades after applying enrollment and progress filters.

	Min.	Max.	Average	S.D.
ST Math % Progress	0.7	87.8	38.6	21.0

Table 1: Descriptive Statistics of ST Math Percent Progress for >= 85 percent Enrollment Grades

Grades with >= 85% Enrollment:	144
Grades with in addition >= 40% Progress:	70

Table 2: Number of ST Math Grades with >= 85 percent Enrollment and with >= 40 percent progress

3.3.2 Filtering Treatment and Controls

Table 3 shows the total number of grades in the Treatment pool, the number of grades that exceeded the 85% Enrollment figure, and also the 40% Progress filter. Other rows in the table indicate counts of numbers of students (2018/19 from state testing count) and counts of number of schools represented. The number of matched Control (CTRL) grades, students, and schools is also shown.

	Grade 3	Grade 4	Grade 5	Total
ST Math Using Grades	79	68	64	211
ST Math Using Schools	79	68	64	99
ST Math Students	3529	2893	2718	9140
ST Math Grades (Enroll >= 85%)	54	45	45	144
TRT Grades (Enroll >= 85% & Prog >= 40%)	31	23	16	70
TRT Schools (Enroll >= 85% & Prog >= 40%)	31	23	16	45
TRT Students (Enroll >= 85% & Prog >= 40%)	1495	993	582	3070
CTRL Grades	31	23	16	70
CTRL Schools	30	23	16	66
CTRL Students	1170	929	724	2823

Table 3: Treatment Pool Filtering and Controls: Counts of Grades, Schools, and Students

3.3.3 Match of Controls to Treatment

Figure 2 shows the density plots of the baseline z-score of percent students at state assessment Proficient or Advanced (left plot) and the percentage of students needing free or reduced lunch (right plot) for treatment grades overlayed on control grades, showing the closeness of the match obtained between Treatment and Control sets of grades in the baseline year.

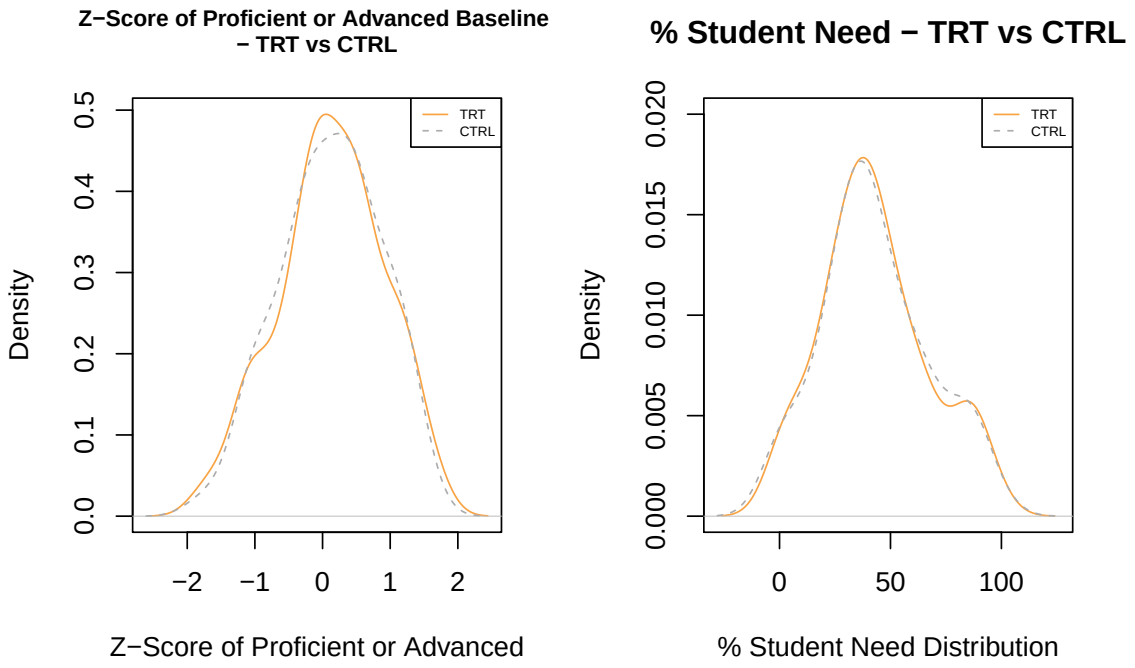

Figure 2: Baseline Year Density Plots Showing Math Scores and Percent Student Need Match between TRT and CTRL - Baseline

Table 4 shows the difference of the means of Treatment versus Control in the baseline year, with accompanying p-values, for mean z-score of percent Proficient or Advanced and for percent of students receiving free or reduced lunch. The large p-values show the differences between the Treatment and Control grades are not statistically significant.

	Mean(TRT)	SD(TRT)	Mean(CTRL)	SD(CTRL)	Estimate	P-Value	Effect Size
Z-Score of Proficient or Advanced - Baseline	0.13	0.78	0.12	0.75	0.01	0.94	0.01
Percent Free or Reduced Lunch	43.19	24.04	43.29	24.22	-0.10	0.98	-0.00

Table 4: Matching TRT and CTRL

3.4 Grade-Aggregated Analysis

Table 5 shows for both Treatment (TRT) and Control (CTRL) aggregation across grades of z-score distributions. The far right column also shows the average ST Math Progress for the TRT set.

	# Grades	# Schools	# Students	Z-Score	Percentile	ST Math Per Comp.
TRT.Baseline	70	45	3049	0.13	54.41	–
TRT.18.19	70	45	2824	0.36	62.04	56.38
TRT.Delta	–	–	–	0.23	7.63	–
CTRL.Baseline	70	66	2835	0.12	54.14	–
CTRL.18.19	70	66	2823	-0.05	49.66	–
CTRL.Delta	–	–	–	-0.17	-4.49	–

Table 5: All Grades Together Growth

Figure 3 shows the changes in mean z-scores of percent Proficient or Advanced for the grade-aggregated Treatment and Control sets.

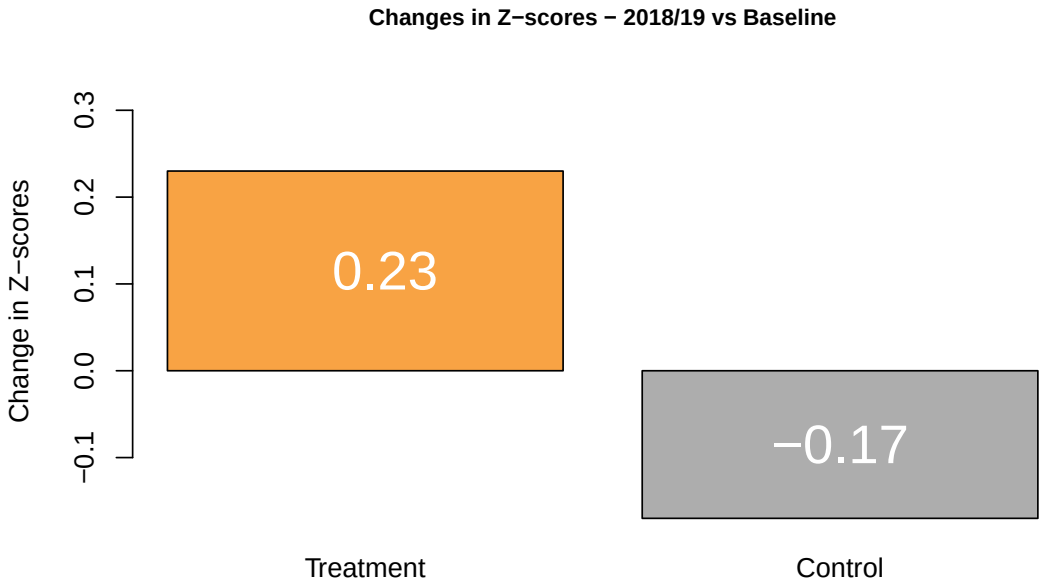

Figure 3: Changes in z-scores (See Section 3.1) for Grade-Aggregated TRT and CTRL datasets between Baseline and 2018/19

Further, Table 6 shows the statistics for the *differences* in changes between TRT and CTRL (Treatment - Control) for these same z-score changes as in the above figure. [1]

	Estimate	P-Value	Int.Low	Int.High
Z-Score	0.40	0.00*	0.13	0.67

Table 6: Statistics for the Differential Changes in Math Scores Growth (TRT - CTRL)

Finally, Figure 4 shows the changes in mean percentile ranking between TRT and CTRL.

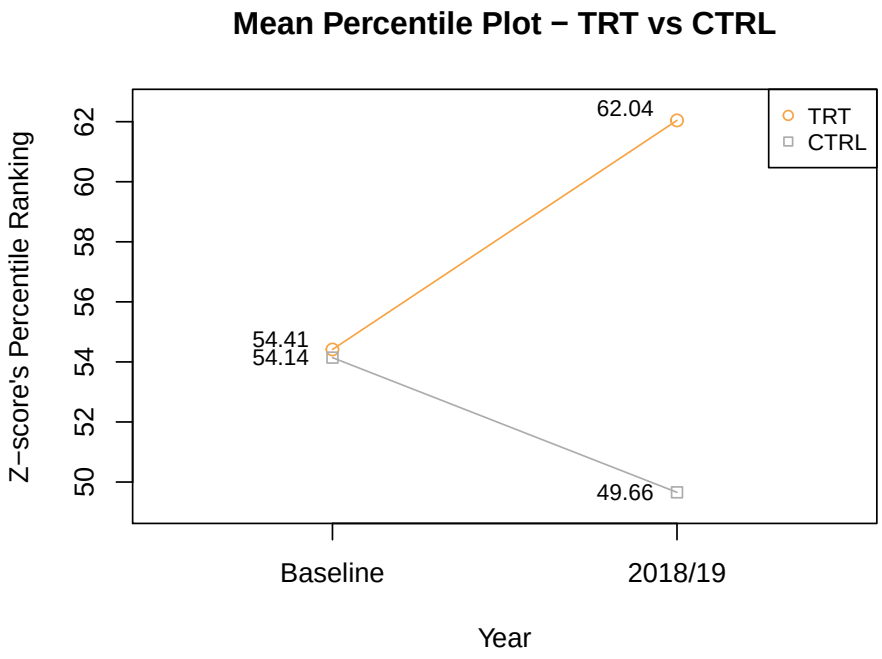

Figure 4: Changes in Percentile Ranking for TRT and CTRL Datasets between Baseline and 2018/19

[1] * statistically significant p<0.05

3.5 Grade-Level Analysis

3.5.1 Grade Level Result Tables

The following tables (Table 7, 8, and 9) present a disaggregation of results by grade level. The far right column in each table also shows the average ST Math Progress for the TRT set.

	# Grades	# Schools	# Students	Z-Score	Percentile	ST Math Per Prog.
TRT.Baseline	31	31	1422	0.16	55.74	–
TRT.18.19	31	31	1322	0.26	59.81	52.92
TRT.Delta	–	–	–	0.10	4.06	–
CTRL.Baseline	31	30	1228	0.15	55.52	–
CTRL.18.19	31	30	1170	-0.21	45.03	–
CTRL.Delta	–	–	–	-0.36	-10.48	–

Table 7: Grade 3 - Yearly Math Performance and Counts for TRT and CTRL Datasets

	# Grades	# Schools	# Students	Z-Score	Percentile	ST Math Per Prog.
TRT.Baseline	23	23	1015	0.08	52.39	–
TRT.18.19	23	23	944	0.32	59.65	59.92
TRT.Delta	–	–	–	0.24	7.26	–
CTRL.Baseline	23	23	900	0.08	52.22	–
CTRL.18.19	23	23	929	0.08	53.78	–
CTRL.Delta	–	–	–	0.01	1.57	–

Table 8: Grade 4 - Yearly Math Performance and Counts for TRT and CTRL Datasets

	# Grades	# Schools	# Students	Z-Score	Percentile	ST Math Per Prog.
TRT.Baseline	16	16	612	0.14	54.75	–
TRT.18.19	16	16	558	0.62	69.81	58.02
TRT.Delta	–	–	–	0.48	15.06	–
CTRL.Baseline	16	16	707	0.13	54.25	–
CTRL.18.19	16	16	724	0.08	52.69	–
CTRL.Delta	–	–	–	-0.05	-1.56	–

Table 9: Grade 5 - Yearly Math Performance and Counts for TRT and CTRL Datasets

3.5.2 Grade-Level Analysis of Changes in Z-scores of Proficient or Advanced

Figure 5 shows the changes in the grade-mean z-scores of students for the TRT and CTRL datasets, disaggregated by grade:

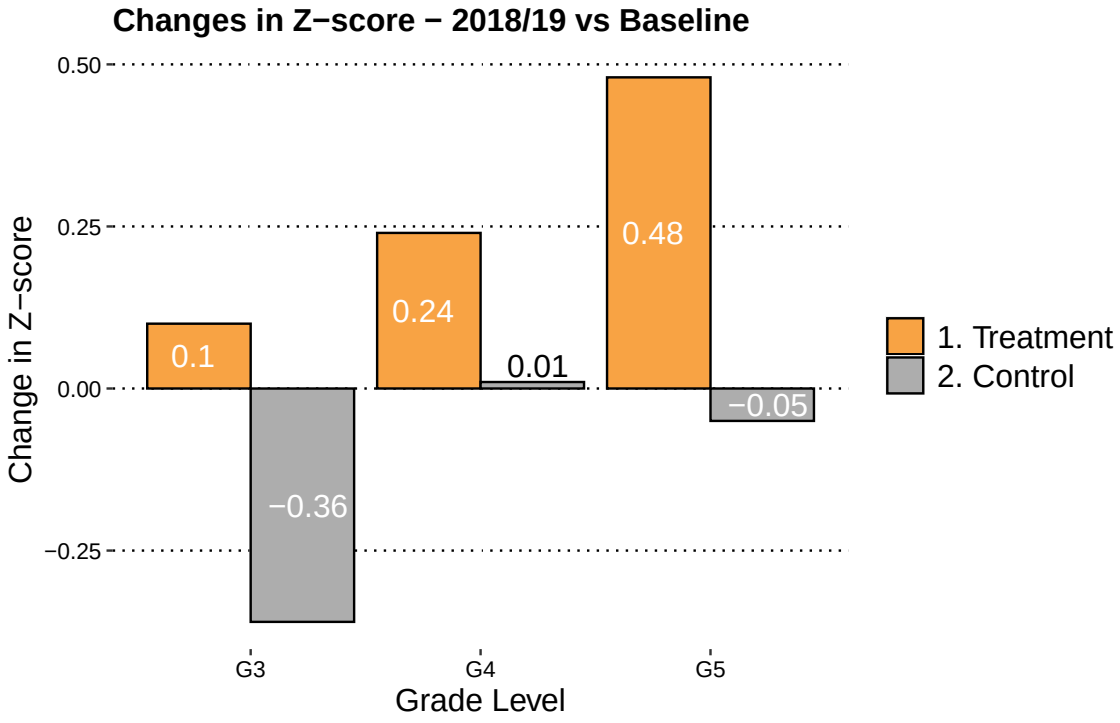

Figure 5: Changes in Grade-Mean Z-score (See Section 3.1) for TRT and CTRL Datasets between Baseline and 2018/19

Table 10 shows the statistics for the differences between TRT and CTRL (Treatment - Control) for these same z-score changes as shown in Figure 5.

	Estimate	P-Value	Int.Low	Int.High
Grade 3	0.46	0.03*	0.05	0.86
Grade 4	0.23	0.36	-0.27	0.73
Grade 5	0.53	0.07	-0.04	1.10

Table 10: Statistics for the Differential Changes in Z-scores (See Section 3.1) Growth, (TRT - CTRL)

4 Effect Size

The following table shows the effect sizes for z-score of Proficient or Advanced.

	Z-Score of Proficient or Advanced Effect Size
Grade 3	0.56
Grade 4	0.31
Grade 5	0.83
All Grades	0.54

Table 11: Cohen's d Effect Size

5 Findings Summary

USA grades 3, 4, and 5 using ST Math with low district enrollment for the year 2018/19 averaged 32.5% ST Math Progress. 82/211 grades (39%) averaged covering more than 40% of ST Math content. Statistically significant differences were found in this analysis for both grade-aggregated and individual grade levels. Looking at Table 6, a statistically significant differences was found for grade-aggregated z-score, with an estimate of 0.4 points favorable for the ST Math treatment set. Furthermore, referring to table 10, grade 3 ST math treatment set outperformed their matched controls for z-scores with a statistically significant difference of 0.46.

6 Confounders

Despite best efforts in minimizing confounders to the results of this analysis, there still remain a few input variables that could be significant in affecting differences of state test score outcomes between the Treatment and Control sets. One issue is the lack of randomization of grades chosen to receive the ST Math treatment. Instead of randomized selection, Treatment grades are self-selected. Self-selection can be an indication of districts or schools with a focus on math, an appetite for change, and with a spotlight on math training. Furthermore, not all grades using the ST Math program are chosen for analysis. Each grade must pass two specific filters to be considered for the Treatment set: the first being an enrollment filter of at least 85% of students in each grade using the program, and the second being a progress filter of at least 40% of the program completed on average by students in that grade. These filters might indicate relatively high-functioning schools with a team of relatively effective teachers in that grade, thus resulting in better instruction overall. A mitigation of this possible confounder is our selection of treatment groups on the grade level, rather than the teacher level, so there is no cherry picking of teachers: the full range of teachers in each grade is included. Moreover, the specific teachers may often be the same in the baseline year as in the current year, so the Treatment growth is not due to teacher differences. Finally, a possible confounder lies in the "business as usual" conditions at the matched control grades chosen for each analysis. It's unknown whether these control grades used other programs that could affect the comparison of the two sets of grades.

7 Lists of Schools

7.1 Treatment Schools

The following table lists the treatment schools and grades (after 85% enrollment and 40% progress filtering) used in the analysis.

PID	IID	State	District	School Name	GRADE
4033774	TOP6O3	AZ	Topock Elementary District	Topock Elementary School	3
131740	BUT7EX	CA	Butteville Union Elementary	Butteville Elementary	3
120741	CAY77J	CA	Cayucos Elementary	Cayucos Elementary	5, 4
60531	TRI7DH	CA	Klamath-Trinity Joint Unified	Trinity Valley Elementary	3
2223313	MIL7DS	CA	Latrobe	Miller's Hill	4
121252	LIL77L	CA	San Miguel Joint Union	Lillian Larsen Elementary	3, 4, 5
10001137	CAP77K	CA	San Miguel Joint Union	Cappy Culver Elementary	5, 3
65000	UPP7D8	CA	Upper Lake Unified	Upper Lake Elementary	3, 4
241072	BEL40J	IA	Bellevue CSD	Bellevue Elementary School	4, 5, 3
234744	CAM42H	IA	Camanche CSD	Camanche Elementary	3
234433	CEN40K	IA	Central CSD	Central Elementary	4, 3
233843	ROO3XP	IA	Cherokee CSD	Roosevelt Elementary School	3
236297	DAN426	IA	Danville CSD	Danville Elementary School	4, 3
235011	DEL40J	IA	Delwood CSD	Delwood Elementary School	3
244311	EAR3V3	IA	Earlham CSD	Earlham Elementary School	3, 4, 5
230102	NEW40W	IA	Eastern Allamakee CSD	New Albin Elementary School	5
235932	EDG40J	IA	Edgewood-Colesburg CSD	Edgewood-Colesburg Elementary School	4, 5, 3
246668	ESS3ZF	IA	Essex CSD	Essex Elementary School	4, 3
236479	HAR3YM	IA	Harris-Lake Park CSD	Harris-Lake Park Elementary School	5, 4
240391	CRE40T	IA	Howard-Winneshiek CSD	Crestwood Elementary School	5
251479	IRW3YW	IA	IKM-Manning CSD	Irwin Elementary School	3
234079	NEW3WQ	IA	New Hampton CSD	New Hampton Elementary School	4
235085	NOR42J	IA	Northeast CSD	Northeast Elementary School	3
245420	LIN3W6	IA	Osage CSD	Lincoln Elementary Schoo	4, 3
238570	SID3ZH	IA	Sidney CSD	Sidney Elementary School	5
254524	SOU40W	IA	South Winneshiek CSD	South Winneshiek Elementary School	5, 3, 4
245872	STA0RZ	IA	Stanton CSD	Stanton Elementary School	5, 3
238001	TUR40X	IA	Turkey Valley CSD	Turkey Valley Elementary School	4
339502	EAS3K4	IN	Edinburgh Community School Corp	East Side Elementary School	4
485515	ASH0RS	MI	Ashley Community Schools	Ashley Elementary School	4
537168	LAP0RS	MN	Laporte Public School District	Laporte Elementary	3, 4
2110807	THO0OG	NJ	Bethlehem Twp	Thomas B. Conley Elementary School	3
685313	EAS0NR	NJ	East Amwell Twp	East Amwell Township	4, 5, 3
683236	LOG0MG	NJ	Logan Twp	Logan Township Elementary School	3
694895	THO0LU	NJ	Rockaway Boro	Thomas Jefferson Middle School	5
696269	TUC0RS	NJ	Tuckerton Boro	Tuckerton Elementary School	3
713312	HJG6WG	NV	Storey	Hugh Gallagher Elementary School	5
770932	HOW15A	NY	ODESSA-MONTOUR CENTRAL SCHOOL DISTRICT	HOWARD A HANLON ELEMENTARY SCHOOL	4
719782	OXF12G	NY	OXFORD ACADEMY AND CENTRAL SCHOOL DISTRICT	OXFORD ACADEMY MIDDLE SCHOOL	5
927824	NEW1BG	PA	NEWPORT SD	NEWPORT EL SCH	3, 4
1552800	NOR0S1	PA	NORTHERN POTTER SD	NORTHERN POTTER CHILDRENS SCH	3
1049279	HEM5UY	TX	HEMPHILL ISD	HEMPHILL ELEM.	3, 4
1019949	NIX612	TX	NIXON-SMILEY CI	NIXON SMILEY EL	3
1051612	WVS0RS	TX	TULIA ISD	W.V. SWINBURN E	3, 4
1066772	NOR6HE	UT	North Summit District	North Summit School	3

Table 12: Treatment Schools (TRT Dataset)

7.2 Control Schools

The following tables list the control schools and grades (matched control grades to treatment grades) used in the analysis.

PID	State	District	School Name	GRADE
2128921	AZ	St Johns Unified District	Coronado Elementary School	3
92027	CA	Chualar Union	Chualar Elementary	4
137847	CA	Ducor Union Elementary	Ducor Union Elementary	3
60751	CA	Fortuna Elementary	Norman G. Ambrosini Elementary	4
58277	CA	Laton Joint Unified	Laton Elementary	3
1821235	CA	Nevada City Elementary	Deer Creek Elementary	4
4906614	CA	Pacific View Charter 2.0	Pacific View Charter 2.0	3, 4
4305400	CA	Placer Hills Union Elementary	Sierra Hills Elementary	3
59738	CA	Plaza Elementary	Plaza Elementary	5
61585	CA	Seeley Union Elementary	Seeley Elementary	5
137512	CA	Trinity Alps Unified	Weaverville Elementary	3
4941080	CA	Willow Creek Academy	Willow Creek Academy	5
2887878	IA	AHSTW CSD	AHSTW Intermediate School	4
235164	IA	Ar-We-Va CSD	Ar-We-Va Elementary Community School	4
1485726	IA	BCLUW CSD	BCLUW Elementary School	3
230449	IA	Belle Plaine CSD	Longfellow Elementary School	3
249892	IA	Brooklyn-Guernsey-Malcom CSD	Brooklyn-Guernsey-Malcom Elementary School	3
238192	IA	Central Springs CSD	Central Springs Elem. School - Nora Springs	3
234500	IA	Clayton Ridge CSD	Clayton Ridge Elementary School	3, 3
255994	IA	Eagle Grove CSD	Robert Blue School	5
250279	IA	East Sac County CSD	East Sac County Elementary Sac Building	3
240872	IA	English Valleys CSD	English Valleys Elementary School	4, 5
239512	IA	Garner-Hayfield-Ventura CSD	Garner-Hayfield-Ventura Elementary School	4
232942	IA	Glidden-Ralston CSD	Glidden-Ralston Elementary School	3
238867	IA	Grundy Center CSD	Grundy Center Elementary School	4
235360	IA	IKM-Manning CSD	IKM-Manning Middle School	4
240937	IA	Iowa Valley CSD	Iowa Valley Elementary School	4
231613	IA	Janesville Consolidated School District	Janesville Elementary School	5
254653	IA	Lawton-Bronson CSD	Bronson Elementary School	3
241931	IA	Lone Tree CSD	Lone Tree Elementary School	3
254574	IA	Maple Valley-Anthon Oto CSD	Anthon Elementary	4
250009	IA	Montezuma CSD	Montezuma Elementary School	4
250114	IA	Mount Ayr CSD	Mount Ayr Elementary	3
232394	IA	North Butler CSD	North Butler Elementary	5
243795	IA	North Linn CSD	North Linn Elementary	4, 5
241527	IA	PCM CSD	Prairie City Elementary School	3
249268	IA	Riverside CSD	Riverside Community Intermediate School	5
246369	IA	Sheldon CSD	Sheldon Middle School	5
246747	IA	Shenandoah CSD	Shenandoah Middle School	5
240303	IA	Waco CSD	Waco Elementary School	3
233374	IA	West Branch CSD	Hoover Elementary School	4
244268	IA	West Lyon CSD	West Lyon Elementary School	5
245250	IA	West Marshall CSD	West Marshall Elementary School	3
351225	IN	Randolph Eastern School Corp	North Side Elementary School	4
4450184	MI	Beal City Public Schools	Beal City Elementary School	4
537481	MN	Deer River Public School District	King Elementary	3
539283	MN	Lynd Public School District	Lynd Elementary	4
671465	NJ	Delanco Twp	M. Joan Pearson Elementary School	3
666549	NJ	Estell Manor City	Estell Manor Elementary School	4
691386	NJ	Highlands Boro	Highlands Elementary School	3
703109	NJ	Knowlton Twp	Knowlton Township Board Of Education	5
666824	NJ	Margate City	Eugene A. Tighe Middle School	5
671893	NJ	Medford Lakes Boro	Neeta School	3
672562	NJ	Springfield Twp	Springfield Township School	3
712617	NV	Eureka	Eureka Elementary School	5

Table 13: Matched Control Schools (CTRL Dataset)

PID	State	District	School Name	GRADE
716247	NY	FRIENDSHIP CENTRAL SCHOOL DISTRICT	FRIENDSHIP CENTRAL SCHOOL	4
771819	NY	JASPER-TROUPSBURG CENTRAL SCHOOL DISTRICT	JASPER-TROUPSBURG ELEMENTARY SCHOOL	5
908593	PA	JOHNSONBURG AREA SD	JOHNSONBURG AREA EL SCH	4
897803	PA	MORRISVILLE BOROUGH SD	MORRISVILLE INTERMEDIATE SCH	3
908672	PA	RIDGWAY AREA SD	FRANCIS S GRANDINETTI EL SCH	3
1004736	TX	AVINGER ISD	AVINGER SCHOOL	3
1057381	TX	BIG SANDY ISD	BIG SANDY ELEM.	3
1013115	TX	COOPER ISD	COOPER ELEM.	4
1021875	TX	PETERSBURG ISD	PETERSBURG SCHO	4
1007996	TX	RALLS ISD	RALLS ELEM.	3
1063108	UT	Alpine District	Manila School	3

Table 14: Matched Control Schools (CTRL Dataset)