JOHNS HOPKINS
SCHOOL of EDUCATION

Center for Research and Reform in Education

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REVEAL MATH

Efficacy Study of McGraw Hill's Reveal Math Program

ESSA EVIDENCE

REVEAL MATH

EFFICACY STUDY OF MCGRAW HILL'S REVEAL MATH PROGRAM

ESSA TIERS OF EVIDENCE [1]

The CRRE authors of this study judge the evidence obtained to meet criteria for the Every Student Succeeds Act (ESSA) at:

TIER 2 (MODERATE EVIDENCE)

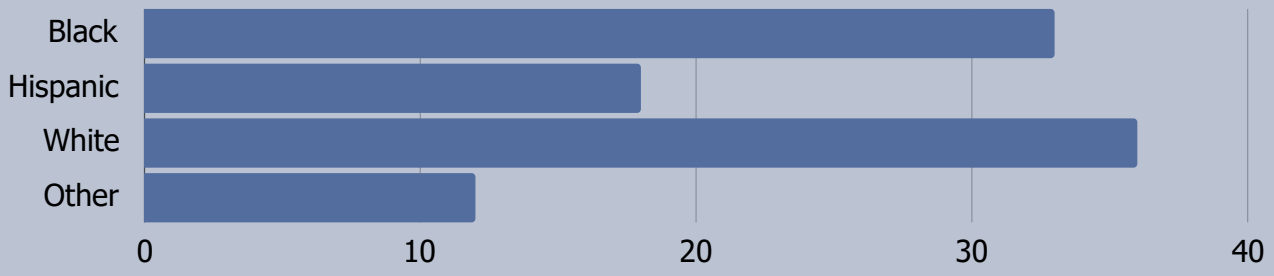
Demographics & Setting

15 Schools

8,625 Students (Grades K-5)

185 Teachers

2 Districts



Study Design

Quasi-Experimental Design (QED)

1 School Year

NWEA Math Assessment BOY & EOY

Group 1

Reveal Math

Group 2

Matched-Virtual Comparison

Results

This Quasi-Experimental Design (QED) study in two school districts compared the NWEA MAP math scores of grades K-5 students who used the Reveal Math program to a virtual matched-control group having equivalent prior achievement and demographic characteristics. Results of the main impact analyses showed a statistically significant, positive impact of Reveal Math on achievement across the entire analytic sample. Reveal Math students averaged nearly .08 standard deviations higher than the comparison students, a small to moderate effect size. The Reveal Math advantages were most pronounced in the suburban district and in the intermediate grades (3-5).

Efficacy Study of McGraw Hill's Reveal Math Program

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Contents

EXECUTIVE SUMMARY:
Efficacy Study of McGraw Hill's Reveal Math Program

McGraw Hill contracted with the Center for Research and Reform in Education (CRRE) at Johns Hopkins University to evaluate its Reveal Math program in elementary schools during the 2022-23 school year in the Greater Clark County Schools (GCCS) in Jeffersonville, IN and in the Metropolitan School District of Warren Township (MSD of Warren Township) in Indianapolis, IN. GCCS is located in suburban Clark County, enrolling approximately 10,320 students in 18 schools, five of which are elementary schools. MDS of Warren Township is located in urban Marion County, enrolling approximately 11,800 students in 15 schools, 10 of which are elementary schools. For the evaluation, we employed a mixed-methods quasi-experimental design (QED) that compared math achievement gains of students who used Reveal Math to similar students who did not use the program and also surveyed and interviewed teachers regarding their perceptions of Reveal Math.

The following research questions are addressed in this report:

1. To what extent did the Reveal Math group implement with fidelity?
2. Characteristics of teachers; what are the characteristics of their instructional methods; how did they implement their math program?
3. What are teachers' perceptions of their math program?
    a) Ease of use; perceptions of students' quality of mathematical thinking/engagement?
    b) Optional: measure of student self-efficacy
4. What works well and what challenges are faced in implementation?
5. What do teachers like/want to keep versus not like/think needs revision?
6. Do students receiving Reveal Math demonstrate statistically greater growth in mathematics skills in relation to a comparison group that does not use the program?
7. Do changes in mathematics skills vary by student demographic characteristics such as gender and race/ethnicity?

A quasi-experimental design (QED) was used to compare mathematics achievement of Reveal Math students to matched comparison students obtained from two Similar Schools Reports (SSRs), provided by NWEA, to GCCS and MSD of Warren Township. SSRs were used because all schools in both districts used Reveal Math. A Similar Schools Report contains data from students who, relative to the intervention sample, come from schools in a similar area (urban, suburban, rural), with similar percentages of free and reduced meals students (FARMS), creating a "virtual comparison group" of students, and allowing for direct comparison of MAP score growth

between GCCS and MSD of Warren Township students who used Reveal Math and otherwise similar students who did not use Reveal Math.

The evaluation also examined teachers' perceptions and implementation of Reveal Math through an online teacher survey, as well as through teacher interviews. The survey focused on professional development, program benefits, value in teaching and learning, and overall program perceptions. The interview protocol focused on program implementation and perceptions of program impacts and effectiveness, and overall program perceptions. Results of these findings were provided in a preliminary report on qualitative data only and are also incorporated into this final report.

Study Sample

The present study sample included 8,625 Grades K-5 students from across 23 elementary schools in GCCS and MSD of Warren Township. The student population consisted of nearly equal percentages of Black and White Students (around 35% each), along with a somewhat smaller percentage of Hispanic students (18%). The survey sample consisted of 104 teachers (96 from GCCS and eight from MSD of Warren Township), while the interview sample consisted of 10 teachers from both districts.

Program Impact on Mathematics Achievement

Across the entire sample, a small, but statistically significant, positive impact of Reveal Math on mathematics achievement was evidenced, with Reveal Math students outgaining virtual comparison students by approximately 0.8 points. Impacts were more positive in GCCS, with Reveal Math students significantly outscoring virtual comparison students by nearly 2 points. No significant program impacts were evidenced in MSD of Warren Township. Program impacts were most positive in the later elementary grades, with Reveal Math students in Grades 3-5 significantly outgaining virtual comparison students by an average of 2-3 points. Conversely, negative program impacts were evidenced in the early elementary grades, with virtual comparison students outscoring Reveal Math students in Grades K-1 by an average of 1-2 points.

Teacher Program Perceptions

Teacher perceptions of Reveal Math were generally positive, especially in relation to lesson structure and program features. Teachers also expressed positive perceptions of program impacts on student achievement and engagement, especially in the later elementary grades. Teachers generally implemented the program with fidelity, although implementation of individual program components varied considerably across teachers. While teachers generally held positive perceptions of professional development, some teachers expressed a desire for either more training during the year, or training at an earlier time, before the school year. Some teachers also expressed concerns regarding the appropriateness of Reveal Math for students in the early elementary grades.

Overall, teachers were generally satisfied with Reveal Math, and they felt that another year of experience would lead to improved program implementation and effectiveness.

Conclusions

The key results and conclusions of this evaluation are as follows:

- Reveal Math students slightly, but significantly, outgained comparison students identified by two Similar Schools Reports, by approximately 0.8 points.
- Significant positive program impacts in Grades 3-5 were observed, with students in these grades outgaining comparison students by an average of 2-3 points. Conversely, significant negative program impacts were evidenced in Grades K-1, with virtual comparison students outgaining Reveal Math students by an average of 1-2 points.
- Teacher perceptions of Reveal Math were generally positive, especially regarding lesson designs and program features, as well as achievement and engagement benefits for students in later elementary grades.
- Teachers expressed some concerns regarding program effectiveness for SPED and ELL students, as well as students in the earliest grades.
- Some teachers commented that the program website was difficult to navigate. Relatedly, while most teachers expressed satisfaction regarding professional development, some requested additional PD throughout the year, or PD that occurred earlier before the school year started.

Efficacy Study of McGraw Hill's Reveal Math Program

McGraw Hill contracted with the Center for Research and Reform in Education (CRRE) at Johns Hopkins University to evaluate its Reveal Math program in elementary schools during the 2022-23 school year. Participating districts were Greater Clark County Schools (GCCS) in Jeffersonville, IN and the Metropolitan School District of Warren Township (MSD of Warren Township) in Indianapolis, IN. GCCS is located in suburban Clark County, enrolling approximately 10,320 students in 18 schools, five of which are elementary schools. MSD of Warren Township is located in urban Marion County, enrolling approximately 11,800 students in 15 schools, 10 of which are elementary schools. For the evaluation, we employed a mixed-methods quasi-experimental design (QED) that compared math achievement gains of students who used Reveal Math to similar students who did not use the program and surveyed and interviewed teachers regarding their perceptions of Reveal Math.

As described by McGraw Hill, Reveal Math© 2022, is a balanced elementary math program that develops the problem solvers of tomorrow by incorporating both inquiry-focused and teacher-guided instructional strategies within each lesson. In order to uncover the full potential in every student, Reveal Math champions a positive classroom environment, explores mathematics through a flexible lesson design, and tailors classroom activities to student needs. These guiding principles allow students to take ownership of their mathematical journey.

The following research questions are addressed in this report:

1. To what extent did the Reveal Math group implement with fidelity?
2. Characteristics of teachers; what are the characteristics of their instructional methods; how did they implement their math program?
3. What are teachers' perceptions of their math program?
    a) Ease of use; perceptions of students' quality of mathematical thinking/engagement?
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4. What works well and what challenges are faced in implementation?
5. What do teachers like/want to keep versus not like/think needs revision?
6. Do students receiving Reveal Math demonstrate statistically greater growth in mathematics skills in relation to a comparison group that does not use the program?
7. Do changes in mathematics skills vary by student demographic characteristics such as gender and race/ethnicity?

Method

Research Design

A quasi-experimental design (QED) was used to compare mathematics achievement of Reveal Math students to that of matched comparison student data obtained through Similar Schools Reports provided by NWEA, through each of the intervention districts. Similar Schools Reports contain data from students who, relative to the intervention students at each district, come from schools in a similar area (urban, suburban, rural), with similar percentages of free and reduced meals students (FARMS). Additionally, students as a group are matched on the basis of grade level and prior MAP mathematics achievement, as well as demographic variables including gender and ethnicity. This creates "virtual control" groups of students, allowing for direct comparisons of MAP score growth between intervention students and otherwise similar students who did not use Reveal Math. In addition, program usage from McGraw Hill data were also obtained as were program perceptions of implementing teachers through an online teacher survey and teacher interviews conducted by JHU researchers in spring 2023. Protocols are provided in Appendices A and B of this report.

Participants

Participants included Grades K-5 students across both school districts with non-missing MAP mathematics scores from BOY and EOY in the 2022-23 school year. District wide, 58% of GCCS students are White, followed by Hispanic (15%) and Black (14%) students. Slightly more than one-third of GCCS students (37%) are economically disadvantaged, and 9% of students are ELLs. In MSD of Warren Township, 55% of students are Black, followed by White (19%) and Hispanic (18%). A majority of students (62%) are economically disadvantaged, and 11% of students were ELLs. Table 1 overviews the demographic makeup of students included in the analytic sample in each district.

Table 1

Student Characteristics of Analytic Sample

	Greater Clark County Schools	MSD Warren Township	All
Group	Percentages	Percentages	Percentages
% Black	12.83	52.93	33.38
% White	57.37	16.04	36.20
% Hispanic	15.22	21.45	18.41
% Other Race	14.57	9.57	12.01
% Female	49.07	48.86	48.96

N	4,206	4,419	8,625

Sample demographics are very similar for each district's analytic sample, in relation to its respective district-wide demographics. However, the two districts markedly differed in ethnic compensation, with many more Black students in MSD than in GCCS (52.9% versus 12.83%) and fewer White students (16.04% versus 57.37%). Across the combined sample, similar percentages of White and Black students were observed, with somewhat smaller percentages of Hispanic and Other Race students present.

A total of 185 treatment teachers across Grades K-5 in 15 elementary schools across the two districts were invited to complete the questionnaire and were offered an incentive in the form of a $25 gift card for their participation. A total of 104 participants completed the questionnaire, 96 in GCCS (56% response rate), and eight in MSD of Warren Township (80% response rate)[1].

In addition, all teachers who completed the questionnaire were invited to participate in an interview regarding their personal perceptions of the Reveal Math program and were offered an incentive in the form of a $50 gift card for their participation. Ten elementary school teachers volunteered to participate in these interviews, with eight representing GCCS and two representing MSD of Warren Township.

Measures

NWEA MAP Mathematics. Each district provided 2022-23 BOY and EOY NWEA MAP Mathematics assessment scores for all Grades K-5 students in district elementary schools that used Reveal Math. MAP RIT Growth scores are vertically scaled so that scores can be directly compared across grade levels. Table 2 shows the ranges of MAP RIT Growth Mathematics scores for students in each district at the end of the 2022-23 school year.

Table 2

MAP RIT Math Score Ranges, by Grade

	Greater Clark County Schools	MSD Warren Township
Grade	MAP RIT Math score range	MAP RIT Math score range
Grade K	118-205	119-203
Grade 1	113-216	124-215
Grade 2	135-233	119-233

[1] Teacher survey link was only distributed to teachers in four MSD of Warren Township elementary schools.

	Greater Clark County Schools	MSD Warren Township
Grade	MAP RIT Math score range	MAP RIT Math score range
Grade 3	138-243	129-242
Grade 4	140-250	143-256
Grade 5	143-267	147-254

Reveal Math usage data. McGraw Hill provided CRRE with student-level usage data from each implementing district. Usage data provided counts of user program launches, as well as counts of assignments attempted. We analyzed these data descriptively for each district, as well as by grade level. Usage data were linkable to NWEA MAP score data, so Pearson correlations were computed to examine associations between Reveal Math program usage metrics and mathematics achievement.

Teacher Survey. Survey items consisted of closed-ended items, Likert-scale items, and five open-ended items. Survey items covered topics including teacher training; preparedness to incorporate curriculum support tools; Reveal Math's educational benefits, ease of use, and value in teaching and learning; and overall perceptions of the Reveal Math program. A copy of the full teacher survey can be found in Appendix A.

Teacher interview. Virtual interviews were conducted in spring 2023 with a total of 10 elementary school teachers from GCCS and MSD of Warren Township, to gather feedback about their experiences using the McGraw Hill Reveal Math program. Questions addressed their logistical implementation of the program, opinions on its effectiveness, perceptions of the impact on their students, and suggestions for improvement of the series. Seven teachers worked within a general education environment: three in 2nd grade, one in 3rd grade, one in 4th grade, and two in 5th grade. One teacher taught multiple sections of 3rd and 4th grade high ability math. Another teacher taught 4th and 5th grade special education as a push-in and pull-out instructor. The last teacher worked with 5th graders, splitting the day between a high ability section and a general education section. A copy of the teacher interview protocol can be found in Appendix B.

Analytical Approach

Achievement data for students in Grades K-5 were analyzed descriptively by examining patterns in NWEA MAP mathematics scores for the intervention and Virtual Control Group achievement data for each district. The BOY MAP Growth mathematics score was defined as the pretest measure, while the EOY MAY Growth mathematics score was defined as the posttest measure. Data included in Similar Schools Reports included MAP mathematics scores from fall 2022 (BOY) and spring 2023 (EOY), as well as relevant summary statistics for the virtual comparison group. As students were matched with their virtual comparison counterparts and are otherwise similar in terms

of prior achievement and demographics, dependent t-tests were conducted by CRRE to examine differences in MAP mathematics growth between Reveal Math students and virtual comparison students. Students in both districts were combined for the main analyses, while students in each district were also examined separately in secondary analyses. Student-level usage data were analyzed descriptively to examine trends, and were also used in correlational analyses examining associations between Reveal Math program usage and mathematics achievement.

Analysis of the closed-ended and open-ended quantitative data is presented in this report, including selective summary bar graphs where appropriate. Qualitative data from open-ended response items and interviews are summarized, and main themes identified.

Achievement Results

In this section, we describe the results of the QED comparing student MAP mathematics test growth from fall 2022 to spring 2023 of Reveal Math students to that of similar students who did not use Reval Math. MAP mathematics gain scores for treatment and virtual comparison students in Grades K-5, both overall and by grade level and subgroup, are examined in these analyses. Baseline equivalence on MAP mathematics scores is shown in Appendix C; as students were matched by NWEA on prior achievement, this requirement is essentially trivial, and baseline differences did not exceed 0.01 standard deviations on any grade-level comparisons.

Descriptive Analyses

We first descriptively compare separately by district MAP mathematics score trends for Grades K-5 students across the 2022-23 school year. Only students with non-missing spring 2023 (EOY) and fall 2022 (BOY) scores are included in these analyses. Tables 3 and 4 show average MAP math scores at both timepoints for each grade level.

Table 3

Greater Clark County Schools - Average MAP Math Scores, by Grade, Fall 2022 to Spring 2023

	Fall 2022	Spring 2023	Change
Grade K (*n* = *696*)			
Reveal Math	140.34	159.58	19.24
Virtual Comparison	140.33	161.13	20.80
Grade 1 (*n* = *769*)			
Reveal Math	158.92	177.54	18.62
Virtual Comparison	158.92	178.11	19.19
Grade 2 (*n* = *660*)			

Reveal Math	171.06	190.60	19.54
Virtual Comparison	171.10	188.36	17.26
Grade 3 (*n = 715*)			
Reveal Math	182.71	201.93	19.22
Virtual Comparison	182.70	199.61	16.91
Grade 4 (*n = 687*)			
Reveal Math	196.45	213.52	17.07
Virtual Comparison	196.48	208.71	12.23
Grade 5 (*n = 679*)			
Reveal Math	205.76	219.95	14.19
Virtual Comparison	205.76	215.44	9.68

Fall-to-spring gains for Reveal Math students in GCCS were generally comparable to or larger than those for virtual comparison students. The largest advantages for Reveal Math were evidenced in Grades 4 and 5, with treatment students outgaining virtual comparison students by nearly 5 points. Virtual comparison students slightly outgained Grade 1 students by a half-point, and Grade K students by 1.5 points.

Table 4

MSD Warren Township - Average MAP Math Scores, by Grade, Fall 2022 to Spring 2023

Condition	Fall 2022	Spring 2023	Change
Grade K (*n = 747*)			
Reveal Math	134.45	153.96	19.51
Virtual Comparison	134.54	156.56	22.02
Grade 1 (*n = 757*)			
Reveal Math	151.94	170.61	18.67
Virtual Comparison	152.02	171.94	19.92
Grade 2 (*n = 692*)			
Reveal Math	168.87	184.41	15.54
Virtual Comparison	168.93	185.72	16.79
Grade 3 (*n = 776*)			
Reveal Math	175.92	193.86	17.94
Virtual Comparison	175.97	192.53	16.55
Grade 4 (*n = 695*)			
Reveal Math	190.72	204.03	13.31
Virtual Comparison	190.75	203.51	12.76
Grade 5 (*n = 752*)			
Reveal Math	199.26	209.51	10.25
Virtual Comparison	199.29	208.21	8.92

Patterns of gains in MSD Warren Township were somewhat similar to those evidenced in GCCS, although not quite as advantageous for Reveal Math students.

Grades 3-5 Reveal Math students outscored their virtual comparison counterparts by approximately 1-1.5 points at each grade level. Virtual comparison students outgained Reveal Math students in Grades K-2, with advantages of slightly more than 1 point in Grades 1 and 2, and a 2.5-point advantage in Grade K. In all, fall-to-spring gains for Reveal Math students in MSD Warren Township were more mixed than were those for Reveal Math students in GCCS.

Usage data. Reveal Math usage data from each district were analyzed descriptively. Tables 5 and 6 shows counts product launches and attempted assignments across the 2022-23 school year, by district. Grade-level descriptive analyses of Reveal Math program usage data can be found in Appendix D.

Table 5

Average Reveal Math Program Usage, Greater Clark County

Usage Measure	Mean	SD	Minimum	Maximum
Assignment attempts (*n* = 1,711)	12.88	15.13	1	99
Number of launches (*n* = 2,143)	16.73	21.69	1	184

Note. 1. Only students with a non-missing outcome measure (NWEA MAP) were included in this analysis.

Table 6

Average Reveal Math Program Usage, MSD of Warren Township

Usage Measure	Mean	SD	Minimum	Maximum
Assignment attempts (*n* =2,399)	27.72	32.37	1	156
Number of launches (*n* = 3,201)	29.84	35.06	1	304

Note. 1. Only students with a non-missing outcome measure (NWEA MAP) were included in this analysis.

Usage metrics were consistently higher for MSD of Warren Township students, with students averaging approximately 30 program launches and 28 assignments attempted across the 2022-23 school year. By contract, Greater Clark County students averaged slightly less than 17 program launches and slightly more than 13 attempted assignments across the 2022-23 school year. Distributions of both usage metrics were also wider in MSD of Warren Township, as evidenced by the considerably larger standard deviations associated with both usage metrics, as well as the very large observed maximum values of each usage count.

Impact analyses. Next, we examine the impacts of Reveal Math on MAP mathematics growth gain scores, in relation to virtual comparison students, by conducting dependent (matched) t-tests on MAP mathematics gain scores from fall 2022 to spring 2023. Table 7 shows estimated Reveal Math impacts on MAP

mathematics gains by grade level, across both districts. Students included in these analyses had non-missing fall 2022 and spring 2023 MAP mathematics scores.

Table 7

Reveal Math Impacts on MAP Mathematics Gain Scores

Grade level	T Gain	C Gain	Estimate	Standard Error	*p* value*
Grade K (*n = 1,443*)	19.38	21.42	-2.04***	0.26	<.001
Grade 1 (*n = 1,526*)	18.64	19.56	-0.91**	0.22	.006
Grade 2 (*n = 1,352*)	17.49	17.02	0.48	0.25	.199
Grade 3 (*n = 1,491*)	18.56	16.72	1.84***	0.24	<.001
Grade 4 (*n = 1,382*)	15.17	12.49	2.68***	0.25	<.001
Grade 5 (*n = 1,431*)	12.12	9.27	2.84***	0.24	<.001
All students (*n = 8,625*)	16.93	16.14	0.79**	0.10	.008

Notes. 1. ** $p < .01$; *** $p < .001$. 2. All *p* values are adjusted for school-level clustering.

Overall, the combined program impact across both districts was positive and significant, with Reveal Math students outgaining virtual comparison students by nearly 0.8 points from BOY to EOY MAP mathematics assessment administrations. The effect size of this impact is .08 SDs, indicating a small, but practically notable, positive impact of Reveal Math on student mathematics achievement. By grade level, the most positive program impacts were evidenced in Grades 3-5, with Reveal Math students at these grade levels significantly outgaining virtual comparison students, with advantages of nearly 3 points in Grades 4 and 5, and an advantage of nearly 2 points in Grade 3. Virtual comparison students significantly outgained Reveal Math students in Grades K and 1, by an average of 1-to-2 points.

Impacts by district. In this section, we examine the impacts of Reveal Math on MAP Growth mathematics gain scores, in relation to virtual comparison students, by district. Table 8 shows the results of analyses in GCCS, and Table 9 shows the results of corresponding analyses in MSD of Warren Township.

Table 8

Reveal Math Impacts on MAP Mathematics Gain Scores, GCCS

Grade level	T Gain	C Gain	Estimate	Standard Error	*p* value*
Grade K (*n = 696*)	19.23	20.79	-1.56*	0.40	.012
Grade 1 (*n = 769*)	18.62	19.19	-0.57	0.29	.128
Grade 2 (*n = 660*)	19.55	17.25	2.30***	0.35	<.001
Grade 3 (*n = 715*)	19.22	16.90	2.32***	0.33	<.001

Grade 4 (*n = 687*)	17.07	12.23	4.83***	0.34	<.001
Grade 5 (*n = 679*)	14.19	9.68	4.51***	0.37	<.001
All students (*n = 4,206*)	18.00	16.09	1.91***	0.15	<.001

Notes. 1. * $p < .05$; *** $p < .001$. 2. All *p* values are adjusted for school-level clustering.

A significant positive impact of Reveal Math on MAP mathematics scores was evidenced across all GCCS schools, with Reveal Math students outgaining virtual comparison students by nearly 2 points. The effect size of this impact was .20 SDs, indicating a moderate practical impact of Reveal Math on student mathematics achievement in GCCS schools. Significant positive impacts on mathematics achievement were also evidenced in Grades 2-5 students in GCCS, with advantages of more than 2 points for Grades 2 and 3 students, and advantages of nearly 5 points for Grades 4 and 5 students. A significant negative impact on mathematics achievement was evidenced in Grade K, with virtual comparison students outgaining Reveal Math students by approximately 1.5 points. Across GCCS, though, Reveal Math program impacts were generally quite positive.

Table 9

Reveal Math Impacts on MAP Mathematics Gain Scores, MSD of Warren Township

Grade level	T Gain	C Gain	Estimate	Standard Error	*p* value*
Grade K (*n = 747*)	19.51	22.00	-2.49***	0.34	<.001
Grade 1 (*n = 757*)	18.67	19.93	-1.26**	0.33	.009
Grade 2 (*n = 692*)	15.54	16.79	-1.25*	0.36	.014
Grade 3 (*n = 776*)	17.95	16.55	1.39**	0.34	.006
Grade 4 (*n = 695*)	13.31	12.76	0.55	0.35	.274
Grade 5 (*n = 752*)	10.25	8.91	1.34**	0.32	.004
All students (*n = 4,419*)	15.92	16.19	-0.27	0.14	.485

Notes. 1. * $p < .05$; ** $p < .01$; *** $p < .001$. 2. All *p* values are adjusted for school-level clustering.

Overall, no significant impact of Reveal Math on mathematics achievement was observed in MSD of Warren Township, with virtual comparison students slightly, but not significantly, outgaining Reveal Math students. Significant positive Reveal Math impacts were observed in Grades 3 and 5, with Reveal Math students at each of these grade levels outscoring virtual comparison students by slightly more than 1 point. Virtual comparison students outgained Reveal Math students in Grades K-2, with advantages in gains ranging between 1.25-2.5 points.

Subgroup analyses. We conducted subgroup analyses on the basis of available demographic variables. Gender and race/ethnicity data were the only variables available in these datasets, so we present the results of subgroup analyses for these populations of interest in Table 10.

Table 10

Reveal Math Impacts on MAP Math Gain Scores, Student Subgroups

Group	Estimate	Standard Error	*p* value
Female (*n = 4,223*)	0.512^	0.139	.088
Black (*n = 2,879*)	-0.816*	0.175	.013
Hispanic (*n = 1,588*)	0.566	0.238	.122
Other Race (*n = 1,036*)	0.644^	0.274	.089

Notes. 1. ^ $p < .10$; * $p < .05$. 2. All *p* values are adjusted for school-level clustering.

Associations between usage and achievement. As student-level Reveal Math program usage data were linkable with student achievement data, Pearson correlations between usage metrics and MAP Math gain scores were conducted to probe potential associations between program usage and achievement. Table 11 shows these correlations by district and overall.

Table 11

Correlations Between Reveal Math Program Usage and MAP Gain Scores

	Assignment Attempts		Number of launches	
District	r	*n*	r	*n*
MSD Warren Township	-.02	2,399	-.05***	3,201
Greater Clark County Schools	+.03	1,711	-.03	2,143
Overall	-.04***	4,110	-.06***	5,344

Note. 1. *** $p < .001$.

Statistically significant negative associations between both usage metrics and MAP Mathematics gain scores were observed when considering students across both districts. There was also a significant negative association between the number of program launches and MAP Mathematics gain scores for students in MSD of Warren Township. However, it must be noted that the magnitudes of these associations (and all observed associations) were very small (.06 or less) in magnitude. The significance of these correlations was almost certainly a function of large sample size than of practically significant associations between usage and achievement. In addition, the two usage variables are very coarse in nature, as there are a multitude of other factors that may be related to program usage that are not captured in counts of program launches or assignment attempts. Thus, these analyses may be quite noisy, and the results should be interpreted with caution. In all, there was very little evidence of meaningful associations between Reveal Math usage metrics and MAP Mathematics achievement gains. Grade-level correlation results can be found in Appendix E.

Teacher Perception Results

Major takeaways from teacher survey and interview responses are presented in the section below. We begin with findings pertaining to teacher training and preparedness to implement Reveal Math, as well as ease of use, and value in teaching and learning. These sections are followed by those on implementation, impact on student learning, and overall perceptions regarding Reveal Math.

Background

Table 12 shows the grade(s) taught by survey participants. There was a relatively even distribution of teachers from each grade level, K-5.

Table 12

Survey Respondent Numbers by Grade Level

Grade Level	Number of Respondents/Grade	Percentage of Respondents
Kindergarten	19	18.27%
First Grade	16	15.38%
Second Grade	19	18.27%
Third Grade	16	15.38%
Fourth Grade	16	15.38%
Fifth Grade	18	17.31%
Total	104	100%

Professional Development

Nearly three-quarters (73%, *n* = 76) of survey participants indicated that the Reveal Math training they received was sufficient. Of the 28 (27%) remaining respondents who indicated that they had not received sufficient training, almost all (92.9%, *n* = 26) provided additional feedback explaining their response. The most commonly cited reasons they provided included the following:

- There was too much material to be covered in the allocated training time. Several teachers recommended that training be broken up into several sessions throughout the school year.
- A more in-depth review than was provided was desired for various program components, such as student online resources.
- The lag time between the date of training and the start of implementation was too short to allow teachers to become familiar with the program's features.

Related teacher comments from the survey included, "There is a lot to learn with the McGraw Hill Reveal series. We were taught the basics, but there was a lot to learn on our own," and "We were presented the material but did not have sufficient time to dive into the program to get used to it." Several interview participants also professed to being "overwhelmed," as four teachers specifically said that they felt inundated with information and resources that prevented them from making full use of the program, while three other teachers reported that they felt overwhelmed at the start of the year but were able to get a handle on the majority of the resources over time. Interview participants also noted that teachers who were able to make the most frequent use of Reveal Math's online resources often spent focused time educating themselves on the curriculum's offerings, or they benefitted from school trainings and professional development sessions that included information about Reveal Math's resources. The need for more training and time to explore the resources was something frequently requested by these teachers. Others felt that a concise one-page document with all the available resources listed on it could be a way to increase familiarity and usage.

Survey respondents were asked how prepared they felt to integrate Reveal Math curriculum support tools into their teaching. A strong majority (80.7%) indicated that they felt at least somewhat prepared to integrate the support tools, with only one teacher indicating that they felt very unprepared. Finally, in a more general related query, teachers were asked to rate their level of satisfaction with the ease of implementation of Reveal Math. Nearly 70% of 98 responding teachers reported being satisfied.

Implementation

Detailed information regarding program implementation was largely collected during teacher interviews, with the following findings being obtained. Seven of the ten teachers interviewed felt that they followed Reveal Math's instructional model with fidelity, while two others implemented Reveal Math's model on a less consistent basis. One instructor opted to exclusively use their school's sequence guide, eschewing the program's instructional model, but still retaining most components of the curriculum.

Teachers reported needing to deviate from Reveal Math's format for a variety of reasons. They most often adjusted the model in order to change the lesson's pacing for scheduling purposes, or because their students needed more instruction in order to attain mastery of the content. Educators found that they would sometimes need to add additional practice examples, especially those focused upon critical thinking or multiple-step word problems. Teachers also reported having to deviate from the instructional model in order to satisfy specific district standards that were not a part of the program's format. Examples of these standards included full-unit objectives and decimal division.

Lessons followed an "I do, We do, You do" structure, with five teachers specifically mentioning this style as their guiding method for lesson planning. Educators sequenced their lessons in the same order: whole group instruction, followed by independent and small group work time, and then some form of closure.

Whole-group instruction included the Guided Exploration or Activity Based Exploration, the Reveal Math slide deck or teacher-created presentation, and some form of practice. After guiding the whole-group portion of the lesson, teachers broke their classes out into independent work time, during which students would work on practice pages while teachers pulled small groups. This small group instruction regularly relied upon the program's differentiation resources, but five teachers reported also making use of the practice pages during this time as well. The format of the lesson's closure varied, with some teachers bringing their group back together for a whole-group review or reflection, while others closed out their math block with an individual activity like the exit ticket. Program implementation outside of the classroom was limited, with only a few teachers assigning the homework. An in-depth description of each lesson component follows.

Slide Deck. Seven of the teachers interviewed did not use the slide deck as originally created by McGraw Hill. These teachers chose to snip out parts of Reveal Math's original presentation and insert them into their own lesson format in order to conform with the district, school, or team's standard presentation format—either Google classroom or flip chart. Three teachers did use Reveal Math's slide deck directly and were unanimously enthusiastic about how easy and intuitive it was to edit and present the pre-designed presentation. One of these educators emphasized how convenient it was to refer back to the way they had originally taught a lesson because of the automatic after-edits save function.

When teachers found the need for additions to their presentation, a number of different slides were utilized. Five instructors frequently added the Notice & Wonder sections of the sense-making routine, while three instructors often inserted the number routine. As with other aspects of the curriculum, additional practice and exemplar problems for the slide deck presentation were in frequent demand. Lesson objectives from elsewhere in the program's online tools were regularly inserted into the slide deck, with one teacher also creating their own unit objective to satisfy district standard requirements. Other pieces from Reveal Math's resources that were added to teachers' lesson plans included the On Your Own practice page, and videos from the STEM, Ignite, and Take Another Look Lesson components.

When asked about whether they modified the program's original slides, three instructors emphasized that the learning target slide was most effective when moved to an earlier position so that it preceded the Guided Exploration or Activity Based Exploration slides. These teachers felt that it created a more supportive scaffold for students to understand the reason for the work before diving into it.

Teachers also customized their slide deck presentations in other ways, such as using a smart board, iPad, or document camera to actively mark-up or hand-write notes on the slides during instructional time. Two educators found it useful to be able to project images of the practice pages as they appear in the Student Edition. One teacher, who exclusively used the online Teacher Edition eBook, found it frustrating that the Student Edition page images weren't available digitally, resulting in often having to modify an image of the equivalent Teacher Edition page by blacking out the answers to mimic what the students would be viewing in their own paper books. Another teacher made the process less cumbersome by scanning a copy of the Student Edition book and inserting the file digitally. Both expressed the need for an update to the online resources so that images of the Student Edition book pages were easily accessible.

Guided Exploration and Activity Based Exploration. Three teachers who described the academic ability level of their class as general or average found that they relied upon the Guided Exploration for most lessons, whereas two teachers who described their classes as high or advanced ability appreciated the challenge of the Activity Based Exploration. One first-year teacher felt that the Guided Exploration helped to determine pacing, while another particularly enjoyed the utility of the note page.

When asked whether the Guided Exploration (GE) and Activity Based Exploration (ABE) provided enough instruction for their students, most teachers generally agreed, with seven replying "yes," and three replying "sometimes," depending on the lesson's content. In instances when teachers felt that the GE or ABE required supplementation to help their students fully master a skill, they accessed a variety of resources. Some used materials from prior year's curricula, such as Hundreds-Tens-Ones charts, manipulatives, or video tutorials. However, most stated that they would supplement with other resources provided by Reveal Math, either by repeating the same lesson on a second day of instruction, adding in extra examples, or shifting activities away from their typical independent work functions and into teacher-led whole group activities instead.

Practice. Almost all teachers used the Practice pages on a daily basis, with the exception of the special educator, who reported that it would be employed by the regular classroom teacher during regular instructional time.

The practice component would be employed during any one of three different lesson segments: group instruction, independent work, or small group work. One teacher used the practice pages during all three lesson components, while four other teachers used it only during group instruction or independent work, and the remaining four teachers used it only during independent work or small group work. Two teachers also added that they would sometimes pair students to work on the practice pages together during independent work time.

Teachers specifically discussed two practice pages: On My Own and Additional Practice. Teachers did not use the Additional Practice pages on a consistent basis, mostly turning to them when the lesson required a second day of instruction. They most frequently relied upon the On My Own page, making daily use of the resource. The most popular element of that page was the word problems, which were cited by multiple teachers as a particularly important skill for their students to practice. One teacher, who liked the page but didn't always think it was necessary for students to complete in its entirety, explained that,

> *I always make sure they get practice with those critical thinking, real-world, problem-solving ones with the word problems, since we always struggle with those. It's nice that that's always intertwined everyday into our daily practice.*

Differentiation. The differentiation page was a core curriculum component for nine of the teachers interviewed, with one teacher reporting that she would only sometimes use it, mostly drawing from other differentiation resources collected over her career. The differentiation page was employed during small group work, with one teacher reporting that she also found it helpful during whole group instruction.

Teachers determined the makeup of their small groups for differentiation using a variety of methods. The most frequent method mentioned by five teachers was to circulate the room or observe their students during whole group instruction time and note which students were struggling. Other common differentiation criteria included exit tickets, practice pages, the diagnostic tool, and end of unit assessments. Teachers also mentioned additionally using benchmark data from outside sources, such as NWEA, or district-specific assessments.

Instructors expressed appreciation for the variety of resources that the differentiation page provided to them. The convenience and ease afforded to teachers was touched upon by multiple participants, with one noting the relief of "… not having to spend time hunting for differentiation resources" anymore. All teachers had used parts of both the front page, Reinforce It, and the back page, Extend It, at some point in the year, but tended to use one side more heavily than the other. This was largely determined by the ability level of their students, or by the teacher's desire to focus their students on specific methods of thinking.

The front side, Reinforce It, was the most commonly used side of the differentiation page since teachers found it to be most effective for their struggling learners. One teacher felt that this side "… helps to close the achievement gaps" that are more pronounced for students in the years after the Covid-19 pandemic. Another teacher spoke about the page's specific benefits for her English Language Learner (ELL) students because it came in a Spanish translation. A different instructor said that the Spanish page was the main teaching tool utilized by the ELL co-teacher who sometimes

pushed in to her class. Teachers also noted their gratitude for the "reteach" component at the top, finding that it provided an alternate way of explaining the main lesson's content, with one teacher even sending it home to use as an instructional tool for parents.

Opinions were more mixed about the back side "Extend It" page, with four teachers reporting that it felt too challenging for their students. A teacher who exclusively works with high-ability students did not actually use it often despite knowing that it was tailored to their groups, since the open-ended, fill-in your own numbers format was found to be an impediment to independent use. Another educator repeated this sentiment, saying that, "The style of thinking is not what students are used to." However, three teachers did feel that the page presented an engaging challenge for their higher-level learners, often using it as a bonus activity for the students who completed their other classwork early. One teacher explained that when she knew a student had already mastered a skill, she "… sometimes will use those enrichments as their lesson, so they don't have to repeat things they already know how to do."

The differentiation page was one of the most important parts of the Reveal Math curriculum for the 4th and 5th grade push-in and pull-out special education teacher. She used the sheets in the small group setting, finding that they were mostly useful to check which parts of the full-group lesson her students had understood. She liked that the Reinforce It side of the page backtracks and recaps skills but felt that they sometimes still didn't backtrack enough for her student's specific ability levels.

The teacher who rarely used the differentiation page acknowledged that their rare usage didn't reflect its lack of utility, but more likely indicated feelings of being overwhelmed with the new curriculum and all the resources it entailed. This teacher wanted to stick with differentiation resources that were already comfortable for her to use and that reliably took a specific amount of time after many years of using them with prior curricula.

Homework. Homework was not used by the majority of teachers, with seven respondents not assigning it at all, and three respondents assigning it, but not as a daily requirement.

The teachers who did not assign the homework did not have anything negative to say about Reveal Math's content, with a few teachers even mentioning that they would sometimes use the pages for additional practice in class. Teachers excluded homework from their math instruction because of general philosophical or logistical issues. Some teachers worked at schools that had a blanket policy of not assigning homework due to inconsistent completion rates, low parent involvement, or respect for students' free time. Other teachers felt that homework was generally not a good use of time for them or their students. One teacher summarized all of these sentiments saying, "If they are struggling with the skill, I don't want them to go home and do it wrong."

The three teachers who utilized the homework pages tried to keep their use minimal so as to not overwhelm students. Assignment amounts varied slightly, with two teachers assigning a packet at the start of the week that was due at the end, and the other teacher assigning homework on just two nights per week.

Exit ticket. Every teacher interviewed for this study made use of the program's exit tickets. Eight participants reported daily or frequent use, while two participants reported that they were used sometimes. Seven teachers used exit tickets in paper form, two teachers used them in digital form, and one teacher mixed both paper and digital formats. One teacher who used the exit ticket in paper form felt that she didn't use it enough because having to print them out every time was a barrier to regular use. Teachers who used the exit ticket in digital form appreciated the immediacy of feedback for their students and ease of planning based on reporting data.

When asked how the exit ticket data was used to determine differentiation, four teachers responded that it could provide insight on small group pullouts, and three others found it useful to find out if a particular skill required additional instructional days. Teachers also communicated the exit ticket's utility as a learning check, with one instructor explaining that, "It tells me whether the skill needs more practice before moving on." Others found the resource useful as an entrance ticket, to gauge student's retention of the prior day's lesson before continuing on to a new one. Three teachers also described exit tickets as being useful as a quick quiz or participation grade.

Teacher materials. Teachers reported using a combination of the print Teacher Edition (TE) and the eBook online, though most had a preferred format. Three teachers gravitated mostly to the print format, four teachers gravitated mostly to the eBook format, and three teachers used both formats interchangeably.

Teachers who mostly used the printed TE cited their preference for tactile materials and the need for a break from computer screens that are already prevalent in many other aspects of their jobs. One teacher noted that the print TE aligned with the print Student Edition (SE) more accurately than the eBook did. Those who mostly used the eBook online found it easy to use since it was integrated with all of the additional online resources that aren't found in the print edition. The special education teacher found the availability of every elementary level eBook edition to be especially crucial for streamlining the planning process, since instructors in this field often have to pull resources from multiple grade levels in order to provide differentiation resources that effectively address each student's individual needs.

Student materials. All teachers in this study reported that their students had access to excellent Wi-Fi and a 1:1 device in their classrooms, with two utilizing iPads, and the remaining eight using Chromebooks. Teachers felt that the major impediment to using the technology was the amount of time that it took for students to get their devices set up and navigate to the Reveal Math platform, often eating into precious

instruction time. There were also minor issues with devices not working correctly or not being properly charged in time for instruction.

Teachers reported that during whole group instruction, students would follow a presentation or slide deck projected onto the board. Students in at least four classrooms used math notebooks for note taking and problem solving during this phase of the lesson, and no teachers reported having their students use individual devices during this phase.

Classrooms varied in their logistical formats for students to use Reveal Math during independent work, small group work, and lesson closure. All three of the 2nd grade classrooms opted to use the physical Student Edition (SE) for student work. Each of the teachers in this grade level noted the difficulty of using technology with younger students who are familiar, but not yet fluid with, technology, as well as the higher reliance on reading and typing that is required for students to use digital devices. One 3rd grade teacher and one 5th grade teacher had their students work within the digital version of Reveal Math, while another 5th grade teacher had her students work in the print format for practice pages and online for the exit tickets. One teacher of 4th and 5th grade high ability classes, one 4th grade teacher, and one 5th grade teacher had their students work exclusively within their physical SE, while the 4th and 5th grade special education teacher would use the eBook online to print off targeted pages of materials for her students.

Regardless of whether their students were using the print or digital formats of Reveal Math, teachers wanted to be able to understand how the curriculum would appear from the student's perspective. Teachers employed a number of methods to do this, with four teachers mentioning their reliance on circulating and observing throughout the room, and two teachers acquiring spare copies of the physical SE book. Two teachers mentioned the frustration of not having their own personal copy of the SE, since seeing the materials from a student perspective was crucial for lesson planning, and they frequently wanted to project materials directly on the board without displaying the answers.

Formative Assessment. Many teachers viewed the Indiana Direct Mastery Assessment to be their primary assessment vehicle, but still benefitted from implementing the program's suite of formative assessment tools into their instruction. The exit ticket and daily practice components were integrated into every classroom on a near daily basis—more details about them are contained in prior sections of this report. Reveal Math's two other formative assessment vehicles saw less frequent implementation. The Math Probe was used at least occasionally by half of the teachers, while the other half did not utilize it at all. One teacher particularly appreciated that the Math Probe asks students to explain their thinking and reasoning because it helped her students to focus on "… defending arguments and identifying pieces of their thinking" this year. The Daily Spiral Review was accessed on a mostly infrequent basis by six

educators, while four others did not use it at all. Most of those teachers opted instead to create their own spiral reviews, with one commenting that the program often didn't align with the lessons very well.

Online Resources. All teachers interviewed for this study agreed that Reveal Math contained numerous and varied implementation resources beyond the core instructional components. However, all expressed feeling overwhelmed by the number of resources that they could familiarize themselves with at some point in the school year, especially at the start of the school year. Many did not feel equipped with the proper knowledge as to where these additional resources were located, nor did they feel they had adequate time to dedicate to finding them. Most teachers reported wanting to take a deeper look at all the resources over the summer so that they could be better utilized next school year.

The Readiness Diagnostic tool was the most frequently used resource, with eight teachers using it at some point in the year. The *How ready am I?* component was also cited by multiple educators as an important resource that boosted student confidence. One educator "… liked how students were proud of themselves when they would see how much they'd grown." Another teacher noted that his students were encouraged by their success on the diagnostic, feeling "… excited to see that they know what they know, before we've even had the lesson."

Other supplemental resources were underutilized. The two most popular resources used by teachers, the Glossary and Take Another Look Lessons, were accessed by just 40% of respondents throughout the year. Multiple teachers did note, however, that the Spanish translations in the Glossary were frequently used by their ELL students, and that the Take Another Look videos could be valuable additions to next year's teaching. The eToolkit was accessed by 30% of participants, and the PDF files and Item Analysis Table used by just 20% of participants.

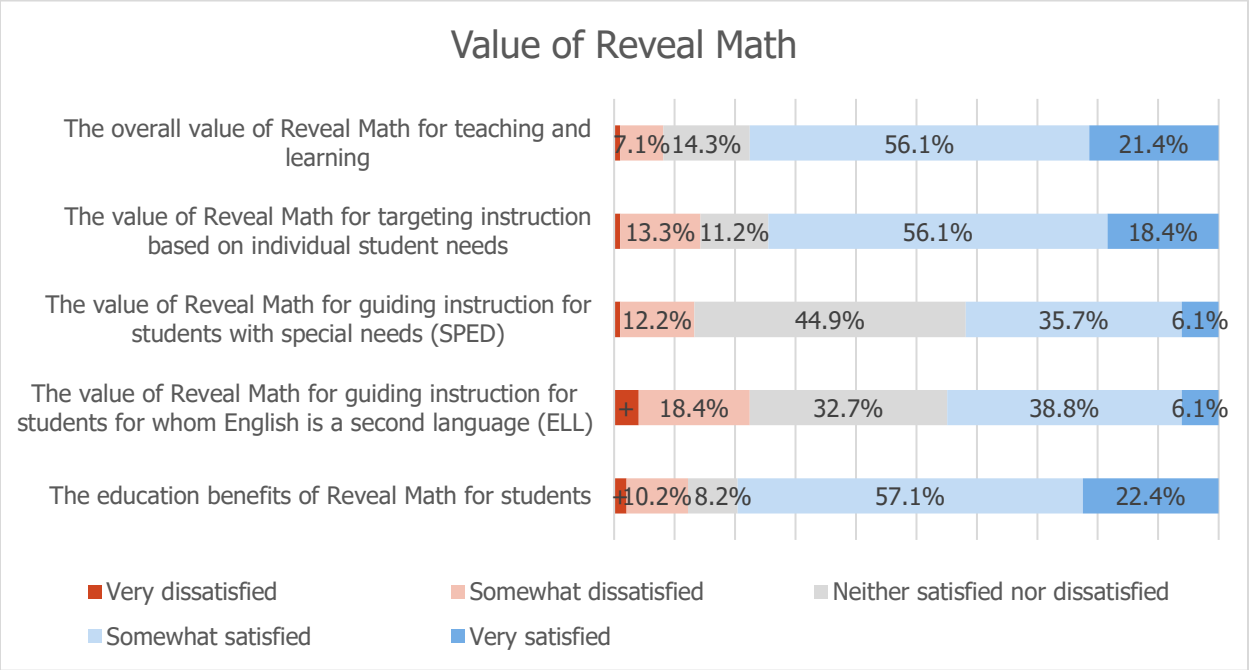
Many teachers had little or no knowledge of the existence of specific online resource offerings. Self-paced professional learning videos had little name recognition, with nine respondents unaware of their existence, and one respondent aware of them but unable to make use of them during the school year. One teacher reported "I don't even know where to get to those resources. The website has been changing throughout the year, they've been updating as we've gone along, I've noticed."

Perceived Impacts on Student Learning

Teacher survey participants reported on their perceived satisfaction with the value of selected aspects of Reveal Math. Figure 1 displays the findings from responses as provided by 98 (94.2%) of the teachers.

Figure 1

Teacher Perceived Satisfaction With the Value of Reveal Math



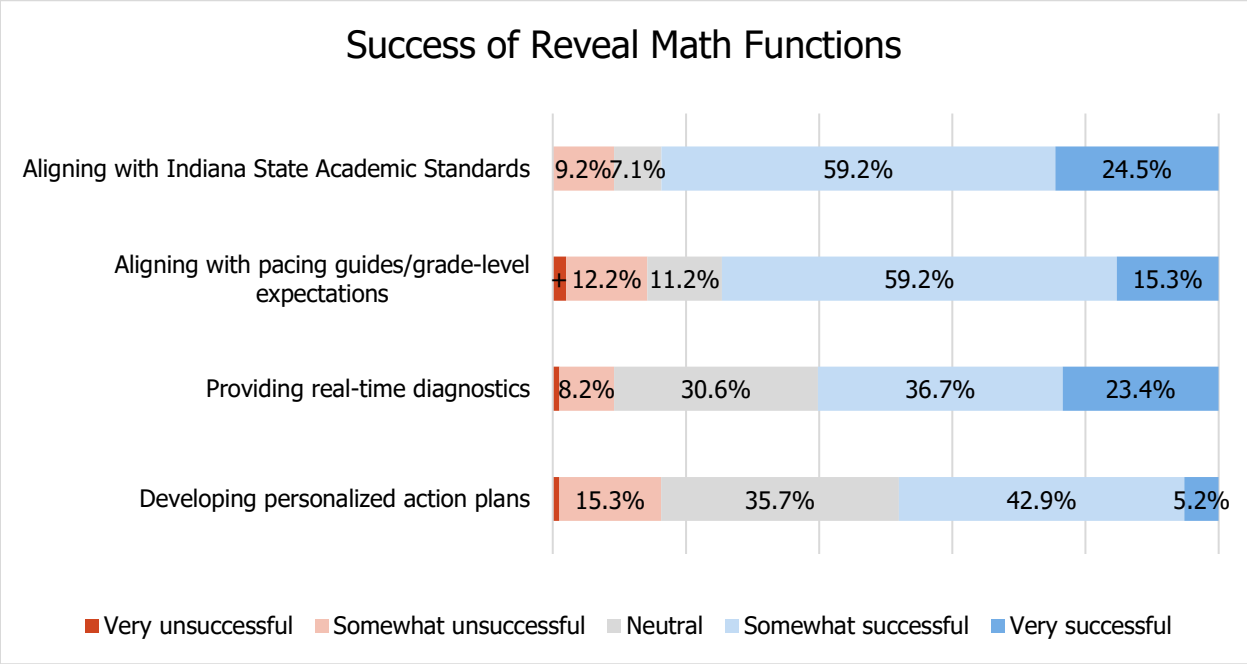
Note. + <5%.

Nearly 80% of teachers were satisfied with the education benefits of Reveal Math for students. Additionally, roughly 75% of teachers voiced their satisfaction with both the overall value of Reveal Math for teaching and learning, as well as for targeted instruction based on individual student needs. Ratings of satisfaction were lower for both the program's value for guiding instruction for students with special needs (SPED) (41.8%) and those for whom English was a second language (ELL) (44.9%). This was supported by feedback obtained during interviews, in which the program weakness most frequently referenced by this sub-sample of teachers was incomplete support for lower-ability students. During interviews, teachers stated that these students tended to struggle with the speed at which lessons were paced, as well as the curriculum's focus on complex word problems. This was particularly notable for a teacher working exclusively with special education students, and for two of the teachers working in 2nd grade. All three teachers had mixed opinions on whether they would recommend Reveal Math to other teachers, saying that they would maybe, or probably not advise for the program. All seemed to believe that Reveal Math would function well for most classrooms but had reservations because of the way that their specific population of students struggled with it. Second grade instructors focused on the program's word-heavy style as the largest obstacle for young students, who were still developing a mastery of reading and writing. The special educator felt that most students with IEPs struggled because of their ability level, often needing more individualized attention and tailored resources than Reveal Math could typically offer.

On the survey, teachers rated the program's success at achieving several key functions such as aligning to Indiana state standards and providing real-time diagnostics. Figure 2 details these findings. Once again, responses were provided by 98 (94.2%) of the teachers.

Figure 2

Teacher Perceived Success of Program Functions



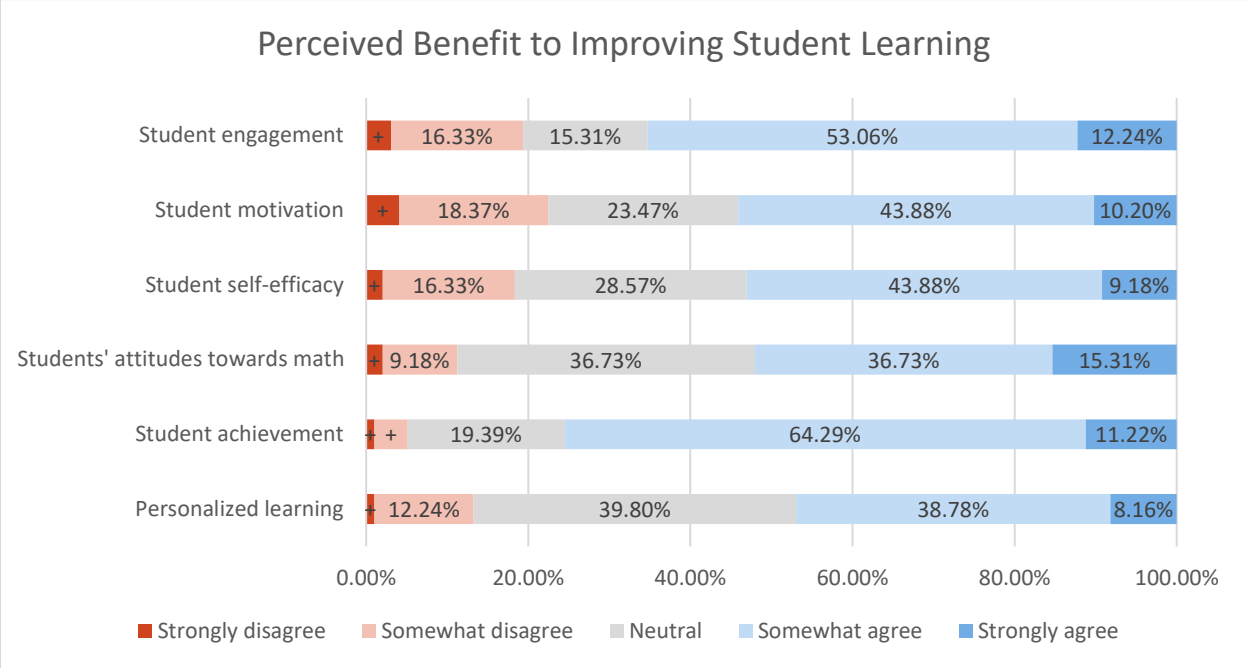
Note. + <5%.

Teacher responses indicated that of the four functions, Reveal Math was most successful in aligning with Indiana Academic Standards (83.7%). Alignment with pacing guides/grade-level expectations was next, with 74.5% of teachers indicating its success. However, perceived success was lower both for the program's providing real-time diagnostics (60.1%) and for its use in developing personalized action plans (48.1%). During interviews, six teachers expressed their surprise or gratitude at how well the curriculum aligned with Indiana's state standards. "We worked our way through the series with fidelity, no jumping around, and that's rare," said one individual, with another adding "… this was the first time that a curriculum's lessons could mostly be followed in order."

Teachers were asked to indicate their level of agreement regarding Reveal Math's benefit in improving various aspects of student learning. Figure 3 displays the findings from responses as provided by 98 (94.2%) of the teachers.

Figure 3

Teacher Perceptions of Reveal Math's Student Learning Benefit



Note. + <5%.

Teachers expressed positive, though largely mixed agreement on the program's benefit in improving various elements of student learning. Notably, agreement was highest (75.6%) for benefit to student achievement and to student engagement (65.3%). A majority of teachers also indicated improvements in student motivation (54.1%), student self-efficacy (53.1%), and student attitudes towards math (52.0%). Benefits to improving personalized learning received the lowest rate of agreement (46.9%).

Teacher interview participants were also asked about the impact of Reveal Math on student learning. Most teachers felt that the program gave students more agency and confidence in their math abilities when compared to prior years' curricula. At least three educators noted that the instructional approach provided students with flexible strategies and multiple pathways to success. Two teachers complimented the variety of DOK (Depth of Knowledge) levels, noticing how well this prepared students for assessments, often lessening the fear and anticipation around testing.

When teachers did bring up their students' growth during interviews, they did so in a positive light. Four teachers in particular were impressed by their students' increased mastery from using this curriculum, and two specifically mentioned increased addition and subtraction fluency. Teacher observations were often backed up by

student assessment data. One teacher communicated their excitement that students had met 100% growth on NWEA for the first time ever this year. Another instructor also touched upon test scores, saying:

> *We saw a very big jump in our math scores on NWEA and iLearn, and this is only the first year we've used this series. And this is the only thing we've changed in our math instruction. So, we definitely contribute some of the growth to this series.*

Overall Perceptions

As part of the survey, teachers were asked five open-ended questions in order for them to provide more extensive feedback, in their own words, on program strengths, challenges, and recommendations for program improvement. The first of these queries asked teachers what they liked best about Reveal Math for themselves. Of the 86 teachers (82.7%) who responded, more than half (*n* = 52, 60.5%) listed the lesson model/design and/or lesson features. Teacher comments included the following: "I love how the lessons are organized. It is helpful to have many resources for our math lessons. I enjoy the student videos and exit tickets. I also love the review units," and, "I like the layout. ... It is in a logical order, and skills build upon themselves," and finally, "I love the way it is set up! Love the error analysis for each lesson." Specific lesson features that were most frequently cited by teachers in their responses included lesson presentations, the "Launch," number routines, and exit tickets. Teachers also liked the Reveal Math resources, with one-third (*n* = 28, 32.6%) reporting they liked the variety of resources available, particularly the online platform. One teacher noted "The interactive website is a benefit! All materials are accessible through the website. This saves teachers time as everything can be projected on an interactive board." Smaller numbers of teachers identified the following "best liked" elements of Reveal Math:

- Ease of use/implementation (*n* = 14, 16.3%)
- Alignment with state standards/district goals (*n* = 7, 8.1%)
- Program pacing (*n* = 6, 7.0%)
- Program videos (*n* = 6, 7.0%)

Teacher comments related to these items included, "I love that it covers Indiana state standards and that the lessons are very well laid out," and "It is easy to follow and teach. I love that the standards are included in the lesson guides and follows the state standards."

Interview participants agreed and reflected upon the fact that this curriculum was particularly user-friendly for instructors. One teacher felt that the ease of use for both students and instructors was Reveal's top strength. Teachers felt that the program's lessons were sensibly ordered, and the skills were connected in a helpful flow.

On the survey, teachers were asked to identify what they liked best about Reveal Math for their students. The 86 (82.7%) teachers who responded provided a varied list of "bests" for students; the most commonly cited responses were as follows:

- The program features, including Notice and Wonder, Number Routines, Games, Exit Tickets, and Launch (*n* = 30, 34.9%)
- The student workbooks (*n* = 15, 17.4%)
- Student engagement (*n* = 10, 11.6%)
- The many opportunities for additional practice (*n* = 8, 9.3%)
- The easy-to-follow design/layout (*n* = 8, 9.3%)

Referencing program features, one teacher stated, "I love the notice and wonder sections of the Launch section. [The students] really get into some great conversations during that part of the lesson." Other teacher comments related to program strengths for students included, "The estimation at the beginning of each unit sent an awesome message about reasonableness to the students. I also loved how the lessons started with number sense activities," and "I love that there is an additional practice book after the lesson to further their understanding."

Smaller numbers of teachers indicated they liked that the program was challenging to students (*n* = 6, 7.0%), offered multiple levels of entry (*n* = 5, 5.8%) and that the program's books and slides were bright and colorful (*n* = 5, 5.8%). Regarding the challenge posed to students, one teacher shared, "It meets them where they are at but also has the potential to challenge students when they are ready," while another spoke to the program's points of entry saying, " … there are multiple levels of entry for the same curriculum - ELL, practice page, extension, etc."

During interviews, several teachers observed that students enjoyed the Notice & Wonder and Be Curious elements of the curriculum. Six teachers noted how these activities focused on conversations that had no right or wrong answers, which built confidence for learners at all levels. One teacher noted that "… it really gets them talking about math, which is good, because a lot of kids don't want to talk about math," and another added "I think it starts the lessons on a positive note." Students also seemed to enjoy the colors, pictures, and characters in the curriculum materials, with three teachers noting how engaging these elements were for their learners. Four teachers also noticed that their classes thrived due to the consistency built into Reveal Math, creating a comforting routine where kids knew what to expect each day.

When asked what they found challenging about Reveal Math for themselves, 89 teachers (85.6%) provided feedback. Teachers referenced two areas as their primary challenges:

- Navigating the online platform, either because it was not user friendly or because the number of options/resources available was so large (*n* = 28, 31.5%)
- Keeping up with the pacing/pacing guide (*n* = 19, 21.3%)

Teachers commenting on the online platform related, "The website is very confusing and time consuming. It feels like there are several places that you have to click before you can get to the daily lesson or the resource that you need," and, "There are too many choices and options that it becomes highly overwhelming." Regarding pacing, one teacher stated, "I believe the pacing is off some of the big "power" standards (multiplication, division, fractions). There are lessons that can be combined with others, and some lessons that need to be stretched out," while another said, "I thought the pacing of some standards was not long enough for my students and we needed to supplement. One thing I had to supplement was number sense activities."

An additional 12 (13.5%) teachers stated that they felt the time allocated for some lessons was too short, with too many skills being covered at one time. This was most notable in the case of the lesson on Time and Money. One teacher commented, "There are not enough lessons for time and money. I had to supplement and have extra practice days for students to get used to and have a handle on mastering the standards." Interestingly, during teacher interviews three specific units were cited by multiple instructors as necessitating an unusually high level of supplementation. Unit 8 in the 2nd grade curriculum, covering concepts of time and money, was considered by all three grade-level instructors to be particularly lacking in the quantity and quality of both lessons and practice examples necessary for students to attain mastery of the subject. As one teacher explained,

> *The money and the time was way too condensed and packed into like one or two lessons, when we spent, I think, two or three weeks on money, and for time like we spent like two weeks on it.*

The remaining units were referenced by their concepts rather than by unit number. The unit on addition and subtraction was noted by two 2nd grade teachers as particularly frustrating for students due to the amount of word problems it contained, requiring the inclusion of extra practice activities and example problems that were less complex. The fractions unit was also recognized as deficient in practice examples and reinforcement instruction across a number of grade levels, as cited by one teacher in each of the 3rd, 4th, and 5th grades.

Survey responses by nine teachers (10.1%) listed the need to supplement material as being challenging, with one noting, "Many questions on DMAs were not taught in the book. Had to supplement." Another nine (10.1%) teachers described varied difficulties encountered with online books not matching paper books, and

incorrect resources being linked on the website. One teacher described their problem saying, "Sometimes the online book did not match the paper book which was confusing for my first grade students."

Other challenges cited by smaller numbers of teachers included:

- Insufficient opportunities to provide students with additional practice (*n* = 5, 5.6%)
- Lack of time for teachers to explore the program and its resources (*n* = 5, 5.6%)
- Bound student books, making it difficult to tear out individual pages (*n* = 4, 4.5%)

Teachers were also asked what they found challenging about Reveal Math for their students. With 86 (82.7%) teachers responding, nine (10.5%) replied "nothing." Amongst the remaining teachers, the most common response (*n* = 23, 26.7%) was that there was insufficient guided practice prior to students working independently. Teachers indicated that this resulted in the independent work and exit tickets sometimes being too difficult for students to complete. One teacher described this by saying, "Not enough practice together before independent … so I had to add in additional practice problems," and another offered, "For many of our students the units moved too quickly through topics or didn't have enough group practice for [students] to truly feel that they had started learning the skills before doing independent work." Several of these teachers also remarked that improving the instructions for independent work would also be helpful in resolving this issue.

Other challenging aspects of implementation for students reported by teachers included:

- Fast pace of lessons/lessons that cover too much material (*n* = 17, 19.8%)
- Difficulty in finding/using online materials (*n* = 12, 14.0%)
- Student workbook is not kid-friendly (*n* = 11, 12.8%)
- Lessons are too wordy, with complex names and vocabulary for some readers (*n* = 10, 11.6%)

Regarding this final item, during the teacher interviews, two veteran teachers in the 2nd grade level stated that the lessons were too wordy for the age and reading ability of their students, regardless of their math aptitude or enthusiasm. One teacher described this difficulty saying, "A lot of times when they would open up their books for us to go through, they immediately wanted to shut down because there was a lot on the page, like a lot of words." It should also be noted that six survey respondents (7.0%) indicated that Reveal Math could be challenging for SPED, ELL, and below-grade-level readers, particularly the pacing and the critical thinking component. One

teacher commented, "The critical thinking is good but difficult for some of the sped, ell students," and another added, "Pacing - I work with sped and needed more to help with understanding for my kids."

When teachers were asked to provide recommendations for improving Reveal Math program use in the future, 82 (78.8%) responded. The most common suggestion from the remaining teachers (*n* = 27, 32.9%) was to make changes/improvements to the online platform. Suggestions, in order of frequency, included:

- Simplify navigation to allow for easier access to materials and resources
- Increase compatibility with Google Classroom
- Make the paper and digital versions of the student workbooks match one another

The next most common recommendation (*n* = 15, 17.1%) was for more lessons to be provided, with some teachers asking for more lessons for each skill while others sought additional lessons of specific types such as Number Sense, spiral lessons, and for students below grade level. One teacher explained, "On some of the more challenging concepts/standards, there are only one or a few lessons. …This is not enough time for students to master," and another added, "Include some more lessons that allow more time for exploration." Twelve teachers (14.6%) proposed that students be provided with more opportunities for practice, for each skill, during presentations, for the lesson on time and money, and as review problems for previous lessons. Other recommendations that were provided by a smaller number of teachers included:

- Creating more/better connections between the program and state standards and state assessments (*n* = 9, 11.0%)
- Offer additional professional development to teachers both before the start of school and during the school year (*n* = 7, 8.5%)

One teacher suggested the program offer a connection to standards in multiple grades to provide easier intervention and another proposed introducing "more performance tasks with multiple parts to assist with state testing." Finally, six teachers (7.3%) said that they had no recommendations to make, and three teachers (3.7%) entered "N/A" in response to the question.

Some of the same recommendations that were suggested in teacher survey responses were also provided by teachers during interviews. A list of the latter appears below, in no particular order:

- Connect standards across grade levels with easily accessible links, so that teachers who need to deepen their differentiation methods can more easily find similar skills at different difficulty levels

- Add more lessons and expand the depth of reinforcement offerings for Units 4 and 8 in 2nd grade, as well as the fractions unit across 3rd, 4th, and 5th grades
- Further integrate Reveal Math with Google Classroom
- Correct the minor errors in the Teacher's Edition answer key and the printing error that resulted in the Student Edition missing pages
- Add more instructional video elements to the regular GE/ABE lessons, rather than featuring videos just at the start of a unit
- Re-align the online eBook so that Spanish page translations can be accessed directly from the equivalent English resource, rather than having to be searched for in other tabs
- Consider adding page translations in more languages, especially French and Chinese
- Add more multiple-step, deep-thinking word problems or story problems to lesson examples and student practice
- Create a simplified overview of all supplemental resources, tailoring the resource guide formats so that teachers can learn about the offerings through both digital and print materials
- Revise and augment the resources that specifically serve lower-level learners in all grade levels

Discussion

The current study was a mixed-methods evaluation designed to provide efficacy evidence for the Reveal Math program and data regarding program implementation and teacher perceptions. Achievement impacts for Grades K-5 students were determined by comparing treatment students in Greater Clark County Schools and MSD of Warren Township who used the program to comparison students identified by NWEA's Similar Schools Reports who did not use the program.

Results of the main impact analyses showed a statistically significant, positive impact of Reveal Math on student mathematics achievement across the entire analytic sample, with Reveal Math students averaging nearly 0.8-point larger MAP mathematics ready gains in relation to virtual comparison students. Results were more positive in GCCS, with Reveal Math students outgaining virtual comparison students by nearly 2 points in that district. Program impacts were generally more positive across the higher grades, with students in Grades 3-5 significantly outgaining virtual comparison students by an average of 2-3 points. Conversely, Reveal Math students in the early elementary grades (Grades K-1) were significantly outgained by virtual comparison students, by an average of 1-2 points.

Additional subgroup analyses showed marginally positive impacts for female students and Other Race students, with Reveal Math students in these subgroups outscoring comparison students in these subgroups by approximately 0.5 points.

Subgroup analyses should be interpreted with caution, though, due to the nature of the matching process that NWEA uses. While NWEA matches students on prior achievement and a variety of school-level variables, students may not be exactly matched on student-level demographic variables, such as race or ethnicity. For example, Black students may not be matched with a group of all Black students, even though the matched students have the same prior achievement and come from schools with similar demographic characteristics. Thus, comparison students in subgroup analyses may not all be of the same student sub-population as treatment students, and results of these analyses should be interpreted slightly more cautiously.

Teacher perceptions of the Reveal Math program were generally positive. The majority of teachers indicated that they had received sufficient professional development relating to Reveal Math, though some teachers indicated that they would benefit from having training occur earlier and more often throughout the school year due to the vast resources available as part of the program. While the number of resources was viewed positively, some teachers found aspects of the program to be overly demanding, particularly at the start of implementation. The majority of teachers, however, stated that they were satisfied with the ease of program implementation. Among the 10 teachers who were interviewed, seven teachers said they would recommend the program to other instructors, while two said maybe. Only one said no.

Implementation was explored in detail during teacher interviews. Most teachers indicated that they had implemented the program with fidelity, while some described adjusting pacing, adding additional practice examples, and making some deviations from the lesson plan in order to satisfy specific district standards. Teachers who utilized the slide deck in full spoke highly of its ease of use. Teachers made use of the program's two approaches to instruction, Activity Based Exploration and Guided Exploration, depending on the academic ability of their students and occasionally supplemented the program materials with other resources provided by Reveal Math. Practice pages, particularly the On My Own page, were used extensively, during various lesson components.

The differentiation page, used primarily during small group work, was also a core program component according to the teachers who participated in interviews. Teachers appreciated the range of resources and ease of use provided by this program feature, and one teacher found it highly effective for use with struggling learners. Teachers were less enthusiastic about the back side of the "Extend It" page, which some found to be too challenging for their students. While the majority of teachers did not use Reveal Math for homework, this was typically due to logistical or philosophical reasons. Teachers regularly utilized the program's Exit Tickets and appreciated the immediacy of feedback for their students.

During interview discussions of implementation teachers also spoke of the teacher and student materials associated with the program. Teachers expressed

individual preferences for use of the print or digital formats with some utilizing both interchangeably. Some voiced frustration in not being able to see how the program appeared from their students' perspective and would have liked to have had a copy of the Student Edition for their own reference. The program's Math Probe and Daily Spiral Review assessment materials were implemented less frequently than others, as many teachers used the Indiana Direct Mastery Assessment as their primary assessment tool.

Supplemental resources appear to have been somewhat underutilized, primarily as a result of teachers not having had the time/opportunity in this first year to grow familiar with what was available to them within the program's numerous and varied resources. Many teachers indicated that they planned to explore and use resources to a greater extent in the next school year.

In open-ended survey responses, teachers spoke positively about Reveal Math's lesson model/design and of the program features, liking them both for themselves and for their students. Program features such as the Number Routines and Exit Tickets were singled out as favorites, and the ease of program use and alignment of the program with state standards were among the things that teachers said they liked best about the program. Challenges posed to teachers by the program included navigation of the online platform, which could be confusing or non-intuitive, and sustaining the pace of the lesson plan. Teachers perceived that the program's greatest challenges to students were a shortage of opportunities to practice newly learned skills and the fast pace of some of the lessons. During both interviews and in survey responses some teachers stated that lessons tended to be too wordy for many students.

Importantly, results from the teacher survey and interviews indicate generally strong teacher satisfaction with the educational benefits of Reveal Math for students, though somewhat less so for SPED/ELL students and for students in the earliest grades. In survey responses, teachers reported that the program was successful in aligning with Indiana Academic Standards and expressed positive, though largely mixed agreement on the program's benefit in improving various elements of student learning. Impacts on student achievement and engagement received the highest ratings of agreement. Most of the interviewees stated that the program gave their students greater agency and confidence in their math abilities as compared to prior years' curricula. In addition, a number of these teachers noted perceived program-related student growth as measured by NWEA and iLearn math scores.

Overall, the teacher perceptions provide positive support for using Reveal Math, especially for improving student achievement and engagement. With a year of experience behind them, they should become more skilled in using the program and exploring its many components. Further evaluation is recommended to determine implementation progress and best practices over time.

Conclusions

The key results and conclusions of this evaluation are as follows:

- Reveal Math students significantly outgained comparison students identified by two Similar Schools Reports, by approximately 0.8 points, with an effect size of .08 SDs.
- Significant positive program impacts in Grades 3-5 were observed, with students in these grades outgaining comparison students by an average of 2-3 points. Conversely, significant negative program impacts were evidenced in Grades K-1, with virtual comparison students outgaining Reveal Math students by an average of 1-2 points.
- Teacher perceptions of Reveal Math were generally positive, especially regarding lesson designs and program features, as well as achievement and engagement benefits for students in later elementary grades.
- Teachers expressed some concerns regarding program effectiveness for SPED and ELL students, as well as students in the earliest grades.
- Some teachers commented that the program website was difficult to navigate. Relatedly, while most teachers expressed satisfaction regarding professional development, some requested additional PD throughout the year, or PD that occurred earlier before the school year started.

Appendix A: Teacher Questionnaire

What is the grade of the majority of your students?

- ○ Kindergarten
- ○ First
- ○ Second
- ○ Third
- ○ Fourth
- ○ Fifth

Was the Reveal Math training you received sufficient?

- ○ Yes
- ○ No

Display This Question:

If Was the Reveal Math training you received sufficient? = No

You replied "no" when asked whether the Reveal Math training you received was sufficient. Please explain why.

_____

_____

_____

_____

_____

How prepared do you feel to integrate Reveal Math curriculum support tools into your teaching?

- ○ Very unprepared
- ○ Somewhat unprepared
- ○ Neutral
- ○ Somewhat prepared
- ○ Very prepared

Please indicate your satisfaction with the following:

	Very dissatisfied	Somewhat dissatisfied	Neither satisfied nor dissatisfied	Somewhat satisfied	Very satisfied
The overall value of Reveal Math for teaching and learning	○	○	○	○	○
The value of Reveal Math for targeting instruction based on individual student needs	○	○	○	○	○
The value of Reveal Math for guiding instruction for students with special needs (SPED)	○	○	○	○	○
The value of Reveal Math for guiding instruction for students for whom English is a second language (ELL)	○	○	○	○	○
The ease of implementing Reveal Math	○	○	○	○	○
The education benefits of Reveal Math for students	○	○	○	○	○

How successful is Reveal Math at:

	Very unsuccessful	Somewhat unsuccessful	Neutral	Somewhat successful	Very successful
Aligning with Indiana State Academic Standards	○	○	○	○	○
Aligning with pacing guides/grade-level expectations	○	○	○	○	○
Providing real-time diagnostics	○	○	○	○	○
Developing personalized action plans	○	○	○	○	○

Please indicate your level of agreement to the following statements. Reveal Math has been beneficial in improving:

	Strongly disagree	Somewhat disagree	Neutral	Somewhat agree	Strongly agree
Student engagement	○	○	○	○	○
Student motivation	○	○	○	○	○
Student self-efficacy	○	○	○	○	○
Students' attitudes towards math	○	○	○	○	○
Student achievement	○	○	○	○	○
Personalized learning	○	○	○	○	○

What do you like best about Reveal Math for yourself?

_____

_____

_____

_____

_____

What do you like best about Reveal Math for your students?

_____

_____

_____

_____

_____

What do you find challenging about Reveal Math for yourself?

_____

_____

_____

_____

_____

What do you find challenging about Reveal Math for your students?

_____

_____

_____

_____

_____

What are your recommendations for improving Reveal Math program use in the future?

_____

_____

_____

_____

_____

Appendix B: Teacher Interview

1. How are you currently using Reveal Math? For example: how you use each component after the Guided Exploration/Activity-Based Exploration?
    - Practice
    - Exit Ticket
    - Differentiation after the GE/ABE.

    1a. Do you use ALL the resources in the differentiation page?
    1b. What do you find useful, not useful (about the page)?
    1c. For the GE/ABE- do you feel that this provides enough instruction? If not, what do you implement into your instruction to ensure students are taught the content/skill in depth to ensure mastery of the skill?

2. Do you feel well enough supported with the resources in the Teacher Edition to implement Reveal's differentiation with fidelity?
    - If **yes**, how do you use the differentiation page in their instruction?
    - If **no**, do you use Reveal as a core and separate program for differentiation?

3. Do you use the print TE when planning or the ebook online?
4. Do you follow the instructional model when planning their lesson for the week/day?
5. What do you have to modify/substitute/add in to your lesson plan that Reveal does not cover?

6. Do you implement Reveal's formative assessment into your unit/lesson level instruction (ie: Math Probe, Exit Ticket, Daily Practice, Daily Spiral Review)?
    - If **yes**, how?
    - If **no**, how do they implement formative assessment into their classroom/daily instruction?

7. Do you use the digital version of Reveal at the lesson level? (For example, do you have kids open their chrome books and SEs every day and use them side by side? Or is there another logistical implementation you use?)
8. Do you use the exit ticket recommendations to determine the day's differentiation?
    - If **no**, do they use the exit ticket? Why do they not use it? When would the exit ticket be useful?

9. How do you determine the groups for differentiation? Do you use the practice page as a way to determine students' level of understanding, small group rotations?
10. Do you refer to Reveal's library of self-pace PL videos? (Do they know it is there?) What would you like to see that would support the implementation of Reveal?
11. Do you use the additional resources that are included on OLP such as the Glossary, eToolkit, Take Another Look Lessons, ARB/DRB PDF, etc.?
    - If **not**, what would they like to have in order to know where and when to refer to these resources?

12. Do you use the slide deck presentation? How do they implement this into their instruction?
    12a. Do they add specific slides under the Lesson Resources for the specific lesson?
    12b. Do they modify/add/remove or simply customize their own slides in addition to the presentation? Which slides and why?
13. How do you follow along with students in the SE for instruction? When/how do you do the practice; whole group, small group, homework?
14. What types of devices do students use (e.g. Chromebook, iPad)? Do you feel that they are limited to implementing the instructional content based on their access to Wi-Fi? What is their access to Wi-Fi?
15. Do you use/find the Readiness Diagnostic useful? Do you use the Item Analysis table? How does this guide your instruction for the unit/lesson level??

To Be Asked If Time Permits

16. To what degree does the program meet the needs of most of your students?

17. To what degree do students enjoy using Reveal math?

18. Would you recommend this program to other educators? Why or why not?

19. What do you see as the strengths of Reveal Math?

20. What suggestions would you have to improve the program?

21. Is there anything else you would like to add?

Appendix C: Baseline Equivalence Tables

Table C1

Unadjusted baseline equivalence, Math analyses, GCCS

	Overall Mean	Treat Mean (SD)	Control Mean (SD)	Adjusted T v C Difference	Pooled Unadjusted SD	Stan. Mean Diff.
Grade K	140.33	140.34 (11.10)	140.33 (10.87)	0.006	10.982	0.001
Grade 1	158.92	158.92 (13.24)	158.92 (13.02)	-0.002	13.130	0.000
Grade 2	171.10	171.06 (15.15)	171.10 (14.93)	-0.040	15.039	-0.003
Grade 3	182.71	182.71 (13.91)	182.70 (12.76)	0.007	13.813	0.001
Grade 4	196.47	196.45 (12.95)	196.48 (18.40)	-0.031	12.858	-0.002
Grade 5	205.76	205.76 (12.60)	205.76 (12.45)	0.000	12.529	0.000
All students	175.46	175.49 (25.70)	175.50 (25.70)	0.009	25.653	0.000

Table C2

Unadjusted baseline equivalence, Math analyses, MSD of Warren Township

	Overall Mean	Treat Mean (SD)	Control Mean (SD)	Adjusted T v C Difference	Pooled Unadjusted SD	Stan. Mean Diff.
Grade K	134.49	134.45 (10.27)	134.54 (10.10)	0.089	10.185	-0.009
Grade 1	151.98	151.94 (12.92)	152.02 (12.76)	-0.075	12.838	-0.006
Grade 2	168.90	168.87 (14.40)	168.93 (14.14)	-0.062	14.266	-0.004
Grade 3	175.95	175.92 (14.45)	175.97 (14.29)	-0.055	14.367	-0.004
Grade 4	190.74	190.72 (13.91)	190.75 (13.80)	-0.034	13.855	-0.002
Grade 5	199.28	199.26 (13.93)	199.29 (13.85)	0.030	13.888	-0.002

All students	170.03	170.00 (25.85)	170.06 (25.75)	-0.059	25.796	-0.002

Appendix D: Descriptive Reveal Math Usage Analyses, by Grade

Table D1

Average Reveal Math Program Usage, Greater Clark County, by Grade

Grade	Mean	SD	Minimum	Maximum
Attempted Assignments				
K (*n* = 21)	1.14	0.36	1	2
1st (*n* = 68)	1.63	1.05	1	6
2nd (*n* = 157)	7.29	5.25	1	21
3rd (*n* = 255)	7.12	8.53	1	35
4th (*n* = 590)	13.72	16.73	1	99
5th (*n* = 620)	17.51	16.34	1	81
Overall (*n* = 1,711)	12.88	15.13	1	99
Number of Launches				
K (*n* = 57)	2.98	2.53	1	13
1st (*n* = 154)	2.45	1.99	1	3
2nd (*n* = 287)	10.84	9.39	1	46
3rd (*n* = 604)	8.30	10.67	1	53
4th (*n* = 633)	20.22	25.44	1	166
5th (*n* = 646)	25.30	24.83	1	646
Overall (*n* = 2,143)	16.73	21.69	1	184

Table D2

Average Reveal Math Program Usage, MSD of Warren Township, by Grade

Grade	Mean	SD	Minimum	Maximum
Attempted Assignments				
K (*n* = 43)	3.79	2.45	1	44
1st (*n* = 428)	22.87	27.37	1	116
2nd (*n* = 321)	16.11	19.90	1	84
3rd (*n* = 381)	29.90	41.17	1	156
4th (*n* = 554)	22.04	27.26	1	121
5th (*n* = 672)	41.34	34.26	1	135
Overall (*n* = 2,399)	27.72	32.37	1	156
Number of Launches				
K (*n* = 162)	5.86	7.96	1	44
1st (*n* = 551)	32.54	37.27	1	248
2nd (*n* = 511)	23.28	27.01	1	160
3rd (*n* = 604)	21.79	33.32	1	236

4th (*n* = 646)	27.29	30.19	1	192
5th (*n* = 727)	46.50	40.06	1	304
Overall (*n* = 3.201)	29.84	35.06	1	304

Appendix E: Grade-level Usage-Achievement Analyses

Table E1

Associations Between Reveal Math Program Launches and EOY Mathematics Achievement

Grade Level	Estimate	S.E.	p-value	N
GCC				
Grade K	0.17	0.458	.710	57
Grade 1	-0.004	0.368	.990	154
Grade 2	-0.06	0.055	.250	287
Grade 3	-0.12**	0.042	.005	366
Grade 4	0.49***	0.013	<.001	633
Grade 5	0.01	0.015	.344	646
Warren				
Grade K	0.04	0.108	.703	162
Grade 1	0.02*	0.010	.031	551
Grade 2	0.01	0.015	.353	511
Grade 3	0.03**	0.011	.002	604
Grade 4	0.01	0.011	.296	646
Grade 5	-0.01	0.008	.055	727

Note: * $p < .05$; ** $p < .01$; *** $p < .001$; All regression analyses controlled for BOY Mathematics Score

Table E2

Associations Between Reveal Math Assignment Attempts and EOY Mathematics Achievement

Grade Level	Estimate	S.E.	p-value	N
GCC				
Grade K	-11.06	6.43	.103	21
Grade 1	-1.79	0.995	.076	68
Grade 2	0.04	0.132	.769	157
Grade 3	-0.15*	0.061	.017	255
Grade 4	0.07**	0.021	.001	590
Grade 5	0.03	0.023	.160	620
Warren				
Grade K	0.617	0.997	.539	43
Grade 1	0.04*	0.015	.010	428
Grade 2	0.004	0.026	.888	321
Grade 3	0.04***	0.011	<.001	381
Grade 4	0.03*	0.014	.021	554
Grade 5	-0.02	0.009	.087	672

Note: * $p < .05$; ** $p < .01$; *** $p < .001$; All regression analyses controlled for BOY Mathematics Score