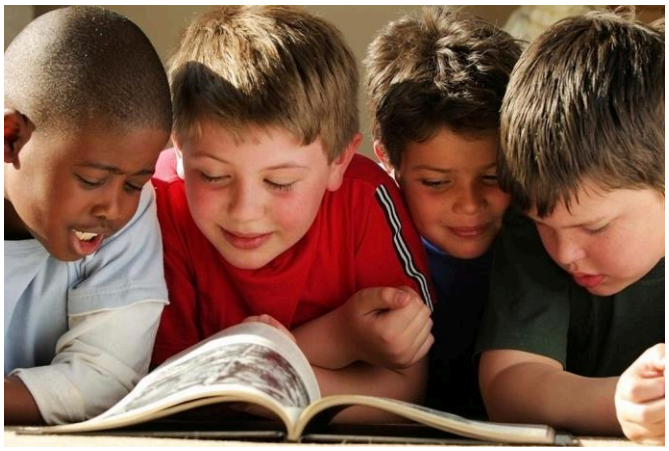


THE IMPACT OF CORE PROFESSIONAL DEVELOPMENT ON STUDENT READING SKILLS GROWTH

January 2020

SEGMEASUREMENT
BUILDING BETTER ASSESSMENTS / EVALUATING PRODUCT EFFECTIVENESS

Executive Summary

SEG Measurement studied the effectiveness of Consortium on Reaching Excellence in Education (CORE) professional development and technical assistance provided to teachers implementing, in addition to their broader English Language Arts instruction, the SIPPS Reading Foundational Skills Program in Pajaro Valley Unified School District during the 2017-2018 school year. The research examined third grade classrooms in the District.

The primary research question addressed by this study is: "Do students in classes with teachers receiving CORE professional development achieve greater reading skill gains than students in classes with teachers who do not receive CORE professional development." We compared student reading skill growth in those classes where teachers were provided CORE professional development to student reading skill growth in classes where teachers did not receive CORE professional development.

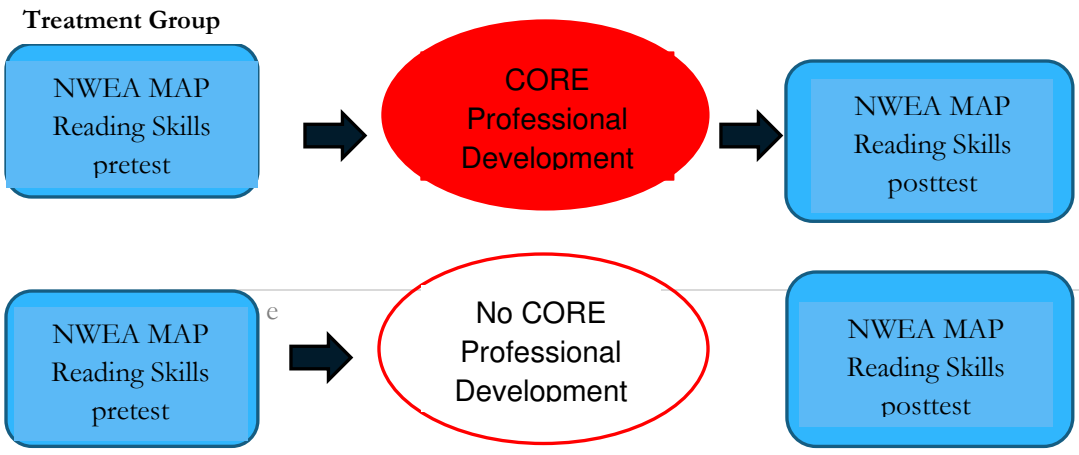
The primary research question addressed in this study is "Do students in classes with teachers receiving CORE professional development achieve greater reading skill gains than students in classes with teachers who do not receive CORE professional development?"

Study Design

This study was designed to meet the design standards for effectiveness research recognized by the professional research community. Specifically, this study was designed to meet the Every Student Succeeds Act (ESSA) guidance for Moderate Evidence (U.S. Department of Education, 2016). The study employed a quasi-experimental, pre-post, treatment-control group design. The reading skills of matched groups of students in classes with teachers receiving CORE professional development (treatment group) and classes with teachers not receiving CORE professional development (control group) were compared. Student reading skills were measured using NWEA's Measures of Academic Progress (MAP) reading assessment at the beginning of the school year (pretest) and at the end of the school year. (posttest)

The study employed a quasi-experimental, pre-post, treatment-control group design.

Figure 1: Study Design



Treatment: CORE Professional Development

The treatment examined in this study is the CORE-provided professional development to assist teachers to understand and implement the SIPPS Foundational Skills Reading program in the Pajaro Valley Unified School District.

Primary grade teachers and administrators received training on how to use the SIPPS curriculum, followed by modified lesson studies to continue to practice, model and guide teachers to ensure the program components are implemented with fidelity.

Sampling

The treatment and control groups were drawn from the approximately 1365 third grade students in the District. One hundred and eighty two students in the two third-grade implementation schools receiving CORE professional development during the 2017-2018 school year served as the treatment-group. Students for the control group were sampled from the remaining schools not participating in the CORE professional development. The 182 treatment group students were matched to 182 comparable students based on multiple characteristics using propensity score matching. A suitable match was found for each of the treatment group students. The results of the propensity score matching indicate that the two study groups were closely matched with respect to important student characteristics.

One hundred and eighty two students in the two third-grade implementation schools receiving CORE professional development during the 2018-2019 school year served as the treatment group… The182 treatment group students were matched to 182 comparable students on the basis of multiple characteristics using propensity score matching.

Analysis

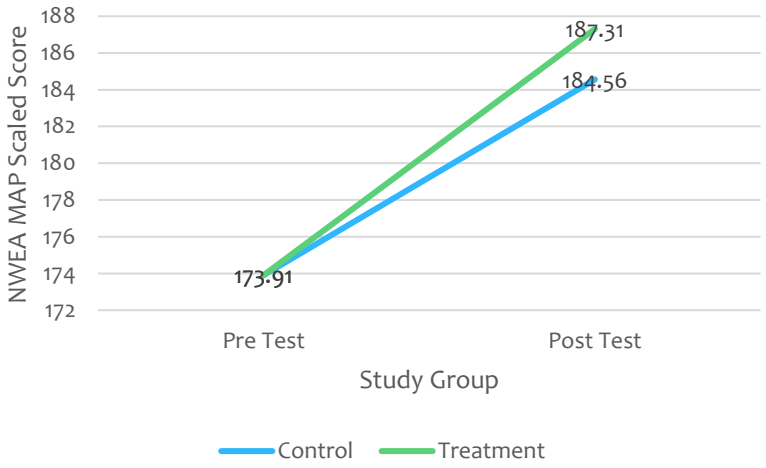
The effectiveness of CORE Professional Development was evaluated. Student reading skills growth in the treatment group was compared to the reading skills growth in the control group using Analysis of Covariance (ANCOVA). ANCOVA can be used to examine the differences in growth between a treatment and control group, while adjusting for any initial differences in reading skills.

Student reading skills growth in the treatment group was compared to the reading skills growth in the control group using Analysis of Covariance (ANCOVA).

Results

Students in classes with teachers receiving CORE professional development showed significantly greater growth in reading skills than did students in classes with teachers who did not receive CORE Professional Development ($F = 5.73$, $df=1/334$; $p<.017$; Effect Size=.17). The mean reading posttest score for the treatment group was 187.31, while the control group mean reading posttest score was 184.56.

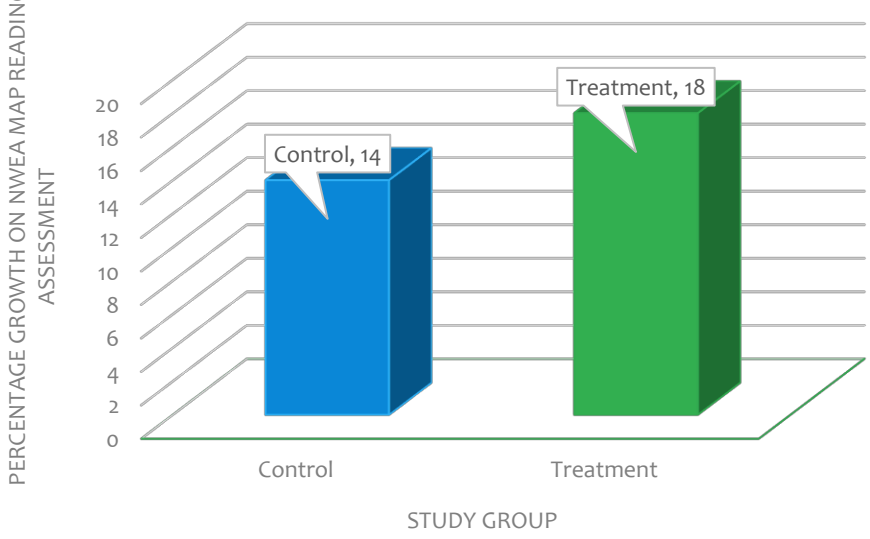
Figure 2
Comparison of Treatment and Control Group Reading Skills Growth Based (NWEA MAP Reading Skills Assessment; Adjusted Pretest Mean)



The treatment group showed 18% growth in reading skills, while the control group showed 14% growth over the course of the school year.

Students in classes with teachers receiving CORE professional development showed significantly greater growth in reading skills than did students in classes with teachers who did not receive CORE Professional Development.

Figure 3
Comparison of Treatment and Control Group Percentage Reading Skills Growth Based (NWEA MAP Reading Skills Assessment; Adjusted Pretest Mean)



The treatment group showed 18% growth in reading skills, while the control group showed 14% growth over the course of the school year.

Conclusion

The results indicate that providing CORE Professional Development for teachers is an effective tool for developing third-grade student reading skills. Students in classes in which teachers received CORE professional development showed greater reading skills growth than comparable students in classes in which teachers did not receive CORE professional development.

We found an effect size for the CORE professional development of .17, or about a fifth of a standard deviation. This effect size, in the context of providing professional development is quite impressive.

In summary, the findings of this study demonstrate that the CORE Professional Development program is effective in fostering student reading skills growth. While other factors certainly contribute to student achievement, (e.g. curriculum and instruction) this study demonstrates that the professional development provided by CORE made the difference in student achievement.

In summary, the findings of this study demonstrate that the CORE Professional Development program is effective in fostering student reading skills growth.

The Impact of CORE Professional Development on Student Reading Skills Growth

Overview

SEG Measurement studied the effectiveness of CORE professional development provided to teachers implementing the SIPPS Reading Program in Pajaro Valley Unified School District during the 2018-2019 school year. Pajaro Valley Unified School District provides elementary teachers with a professional development program to support implementation of the SIPPS Reading Program. CORE began providing professional development during the 2017-2018 school year and has increased the scope of the implementation with each subsequent school year. This study examines the effectiveness of CORE professional development at the third-grade level during the 2017-2018 school year.

Third-grade student reading skill growth in those classes where teachers were provided CORE professional development was compared to student reading skill growth in classes where teachers did not receive CORE professional development. Third-grade student reading skill growth in the two schools receiving CORE professional development services was compared to reading skill growth for a matched group of third-grade students drawn from the remaining schools in the District not receiving CORE professional development services.

Research Questions

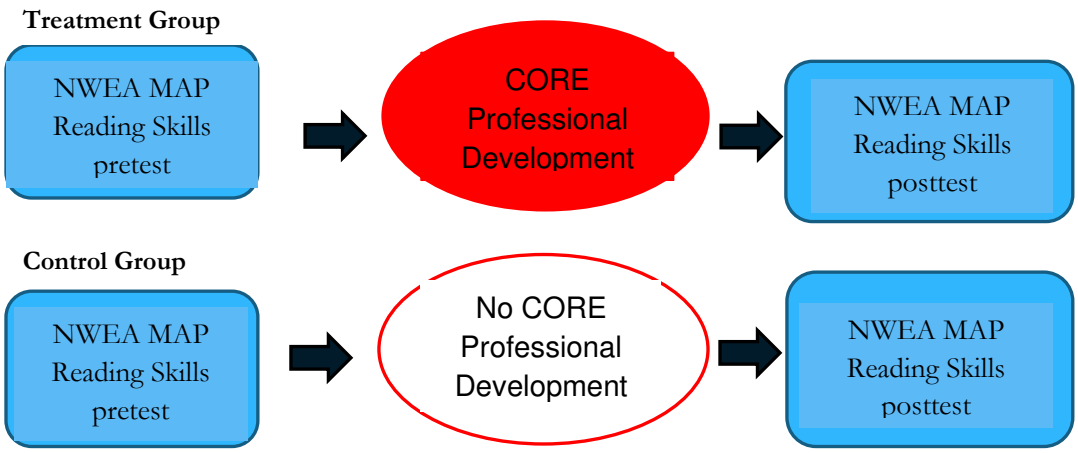
The primary research question addressed by this study is: "Do students in classes with teachers receiving CORE professional development achieve greater gains in reading skills than students in classes with teachers that do not receive CORE professional development? The specific operational questions addressed to answer this are:

- Do students in third grade classrooms in which teachers receive CORE professional development services show larger gains in reading skills than comparable students in third grade classrooms in which teachers do not receive CORE professional development? (main effects)
- Is the impact of CORE professional development greater for any population subgroups? (interaction effects)

Study Design

This study was designed to meet the design standards for effectiveness research recognized by the professional research community. Specifically, this study was designed to meet the Every Student Succeeds Act (ESSA) guidance for Moderate Evidence (U.S. Department of Education, 2016). The study employed a quasi-experimental, pre-post, treatment-control group design. Matched groups of students in classes with teachers receiving CORE professional development (treatment group) and classes with teachers not receiving CORE professional development (control group) were compared. Student reading skills were measured at the beginning of the school year (pretest) and at the end of the school year. (posttest)

Figure 4: Study Design



Treatment: CORE Professional Development

For 25 years the Consortium on Reaching Excellence in Education (CORE) has provided services to more than 100,000 educators at preK-12 schools and districts across the country. CORE offers customized, multi-year professional learning programs to provide the knowledge and skills educators need to implement effective, evidence-based classroom practices in literacy and math that result in sustainable academic excellence.

The treatment examined in this study is the CORE-provided professional development to assist teachers to understand and implement, in addition to their broader English Language Arts instruction, the SIPPS Reading Foundational Skills program in the Pajaro Valley Unified School District. The SIPPS curriculum aligns with the science of reading and focuses on phonemic awareness, phonics, encoding (spelling), polysyllabic word reading and spelling, fluency development, and sight words using an explicit, systematic methodology.

Primary grade teachers and administrators received training first on the science of reading and then on how to use the SIPPS curriculum, followed by modified lesson studies that provided additional modeling and practice to enable teachers to ensure the program components are implemented with fidelity. The CORE consultants provided ongoing classroom coaching to maximize teacher effectiveness in delivering the instructional routines with fidelity. The consultant modeled lesson components and instructional routines, co-taught lessons, and observed and provided feedback. In addition, specific sessions with administrators, especially principals, as well as teachers on special assignment and coaches focused on reviewing the program's progress monitoring data and instructional challenges. Learning walks into classrooms also were conducted to help ensure principals and coaches learned what instruction needed to look like and to learn how to solve problems of practice. Following each site visit, principals and district leaders received a report of findings with next steps for actions.

Since the 2017-2018 school year CORE has provided professional development to the Pajaro Valley District to support the K-2 ELA SIPPS implementation. The work began with 3 schools, focusing on K-1(2) and has increasingly moved to implementations at all 17 district schools.

Measures

Reading skills were measured using the NWEA Measures of Academic Progress (MAP). The MAP was administered at the beginning (pretest) and end of the school year (posttest). MAP is a widely used measure of reading skills. NWEA reports test reliability above .90 and provides validity support drawn from several studies.

The MAP assessment is reported on a single developmental scale covering grades 1-12, facilitating the measurement of growth over time. MAP is both computer-administered and computer-adaptive. MAP scores range from 100-350.

Data Collection

In December 2019, Pajaro Valley Unified School District provided SEG Measurement with a complete 2018-2019 data file for third grade students in the district. For each third-grade student, the data file provided:

- Student name
- Student ID
- School
- Teacher
- Gender
- Ethnicity
- Special Ed status
- ESL status
- Free or reduced lunch eligibility
- Fall 2018 MAP reading score
- Spring 2019 MAP reading score

Sampling

Participants in this study were drawn from the Pajaro Valley Unified School District. Pajaro serves approximately 20,000 students. Approximately half the students are English Learners and nearly three quarters of the students are eligible for free or reduced lunch.

The treatment group was composed of the 182 third grade students in the two professional development implementation schools. A matched group of third grade students was selected from the remaining Pajaro third grade students using propensity score matching. A logistic regression-based propensity score model was used. Sampling was done without replacement and matches were required to be within 5% of the composite propensity score.

Initial Ability. The treatment and control group were well matched in initial ability. The average (mean) fall pretest reading scores for the two study groups were within three points of each other, less than a fifth of a standard deviation apart (.17 SD).

Table1
Comparison of Initial Ability of Treatment and Control Group Sample
(NWEA MAP Reading Pretest)

Study Group	Mean	N	Std. Deviation
Control	171.99	182	14.903
Treatment	174.49	182	13.662
Total	173.24	364	14.331

Gender. The treatment and control group were well matched with respect to gender. There was no significant difference in gender distribution between the two groups (chi square=1.10; df=1; p<.294).

Table 2
Comparison of Gender for Treatment and Control Group Samples

		Gender		Total
		Female	Male	
Study Group	Control	81	101	182
	Treatment	91	91	182
Total		172	192	364

Ethnicity. The ethnicity of the two study groups was similar; more than 95% of the students were Hispanic. There were no significant differences in ethnic distribution of the study groups (chi square=4.34; df=4; p<.362).

Table 3
Comparison of Ethnicity for Treatment and Control Group Samples

		Ethnicity					Total
		Asian	Filipino	Hispanic	Multiple	White	
Study Group	Control	1	2	176	0	3	182
	Treatment	2	0	175	2	3	182
Total		3	2	351	2	6	364

Free and Reduced Lunch. Both the treatment and control groups had a similar distribution of students eligible for free and reduced lunch. Nearly 90% of the students were eligible for free or reduced lunch. There were no significant differences in the distribution of free and reduced lunch eligibility (chi square=1.56; df=2; p<.458).

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Table 4
Comparison of Free and Reduced Lunch Status for Treatment and Control Group Samples

		Free and Reduced Lunch Status			Total
			Free	Reduced	
Study Group	Control	21	143	18	182
	Treatment	25	145	12	182
Total		46	288	30	364

ESL Status. The proportion of students categorized as ESL was similar for both the treatment and control groups. About two thirds of the students were classified as ESL. There were no significant differences in ESL status for the two groups (chi square=1.28; df=1; p<.258).

Table 5
Comparison of ESL Status for Treatment and Control Group Samples

		ESL Status		Total
		No	Yes	
Study Group	Control	62	120	182
	Treatment	52	130	182
Total		114	250	364

Special Needs Status. The treatment and control groups contained a similar proportion of students classified as Special needs. Nearly 90% of the students were classified as Special Needs. There was no significant difference in the special needs status between the two study groups (chi square=180; df=1; p<.180).

Table 6
Comparison of Special Needs Status for Treatment and Control Group Samples

		Special Needs Status		Total
		N	Y	
Study Group	Control	158	24	182
	Treatment	166	16	182
Total		324	40	364

Attrition. While 182 treatment and 182 control students were included in the matched sample, the actual number included in the analyses was approximately 10% to-15% lower due to attrition. Students were required to have both a pre and posttest to be included in the analyses. Students who left the district before the posttest or otherwise did not have a posttest score were not included in the analyses.

Data Analysis/Results

The effectiveness of CORE Professional Development was evaluated. Student reading skills growth in the treatment group was compared to the reading skills growth in the control group using Analysis of Covariance (ANCOVA). ANCOVA can be used to examine the differences in outcomes between a treatment and control group, while adjusting for any differences in initial reading skills. Specifically, ANCOVA was used to examine the differences in reading skills growth (reading posttest scores; dependent variable) between the treatment and control groups (independent variable) while adjusting for the initial reading skills of the students (reading pretest scores). Adjusting for any differences in initial ability helps ensure that both groups have a common baseline starting point.

First, the overall differences in reading skills between the treatment and control group were examined (main effects). Then, SEG explored whether or not CORE professional development was more or less effective for select population subgroups, examining the interactions between study group and student characteristics. subgroups.

Comparison of Treatment and Control Group Reading Skills Growth

Students in classes with teachers receiving CORE professional development showed significantly greater growth in reading skills than did students in classes with teachers who did not receive CORE Professional ($F = 5.73$, $df=1/334$; $p<.017$; Effect Size=.17). The treatment group achieved a mean reading skills posttest score of 187.31, while the control group achieved a mean reading skills posttest score of 184.56.

Table 7
ANCOVA of the
Treatment and Control Group NWEA MAP Reading Posttest Scores

Source	Type III Sum of Squares	df	Mean Square	F	Significance
Corrected Model	52424.94	2	26212.47	240.34	.001
Intercept	2675.10	1	2675.10	24.53	.001
Reading Skills Pretest	50544.83	1	50544.83	463.43	.001
Study Group	625.37	1	625.37	5.73	.017
Error	36100.80	331	109.07		
Total	11631317.00	334			
Corrected Total	88525.74	333			

Table 8
Descriptive Comparison of the Treatment and Control Group
Mean NWEA Reading Posttest Scores (Adjusted for Pretest Performance)

		Posttest Scores	
Group	Number of Students	Mean	Standard Deviation
Control	171	184.56[a]	16.41
Treatment	163	187.31[a]	15.88

a. Covariates are evaluated at the Reading Skills Pretest Score = 173.91.i

The treatment group showed 18% growth in reading skills, while the control group showed 14% growth over the course of the school year

These results are illustrated in figures 4 and 5 below

Figure 4
Comparison of Treatment and Control Group Reading Skills Growth Based (NWEA MAP Reading Skills Assessment; Adjusted Pretest Mean)

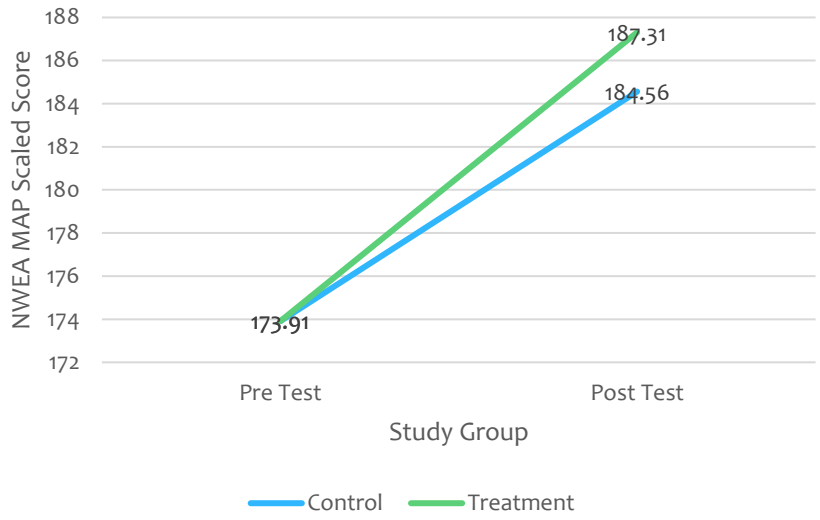
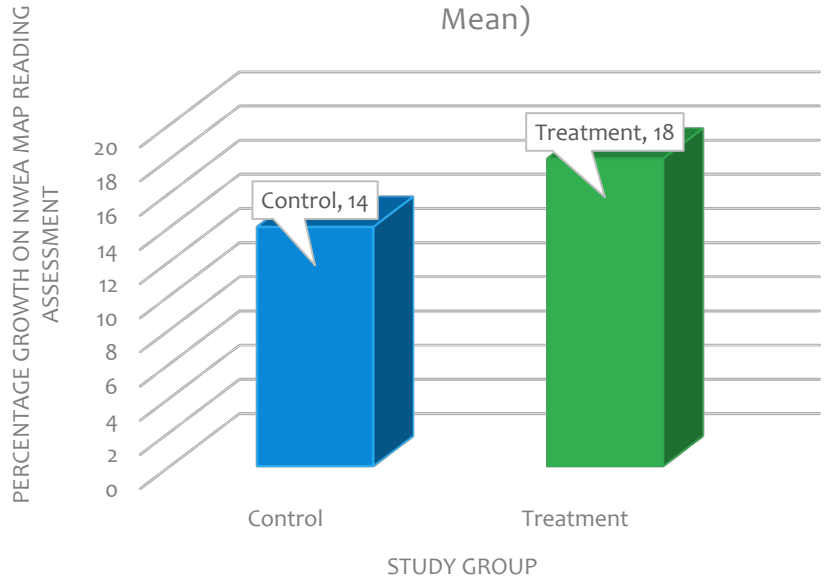


Figure 5
Comparison of Treatment and Control Group Percentage Reading Skills Growth Based (NWEA MAP Reading Skills Assessment; Adjusted Pretest Mean)



Interaction Between Study Group and Student Characteristics

SEG Measurement examined a range of student characteristics in conjunction with Study Group Membership to determine if CORE professional development interacted with student characteristics to moderate or enhance the observed positive impact of CORE professional development on reading skills development.

We examined Gender and ESL status. However, sample sizes for ethnicity, free and reduced lunch eligibility, and Special Needs status were too small to provide a reliable evaluation for these variables. We analyzed the interaction between study group membership and gender/ESL status to further understand the impact of CORE professional development on reading skill development.

There was no significant interaction between Study Group and ESL status (F =.05, df=1/334; p=.826), suggesting that CORE Professional Development was equally effective regardless of ESL status.

Table 9
ANCOVA of the
Treatment and Control Group by ESL Status NWEA MAP Reading Posttest Scores

Source	Type III Sum of Squares	df	Mean Square	F	Significance
Corrected Model	52435.837[a]	4	13108.959	119.50	.001
Intercept	2600.147	1	2600.147	23.70	.001
Reading Skills	48639.021	1	48639.021	443.40	.001
StudyGroup	576.099	1	576.099	5.25	.023
ESLStatus	6.411		6.411	.06	.809
StudyGroup * ESLStatus	5.283	1	5.283	.05	.826
Error	36089.902	329	109.696		
Total	11631317.000	334			
Corrected Total	88525.740	333			

Table 10
Descriptive Comparison of the Treatment and Control Group by ESL statuis
Mean NWEA Reading Posttest Scores (Adjusted for Pretest Performance)

			Posttest Scores	
Group	ESL Status	Number of Students	Mean	Standard Deviation
Control	No	57	187.11	18.03
	Yes	114	181.82	15.32
Treatment	No	45	192.04	18.43
	Yes	118	`186.92	14.63

There was no significant interaction between Study Group and Gender (F =.001, df=334; p=.971), suggesting that CORE Professional Development was equally effective at achieving reading skills growth for both boys and girls

Table 11
ANCOVA of the
Treatment and Control Group by Gender NWEA MAP Reading Posttest Scores

Source	Type III Sum of Squares	Df	Mean Square	F	Significance
Corrected Model	52581.170[a]	4	13145.292	120.319	.001
Intercept	2681.646	1	2681.646	24.545	.001
Reading Skills	50543.886	1	50543.886	462.627	.001
StudyGroup	599.669	1	599.669	5.489	.020
Gender	155.854	1	155.854	1.427	.233
StudyGroup * Gender	.140	1	.140	.001	.971
Error	35944.570	329	109.254		
Total	11631317.000	334			
Corrected Total	88525.740	333			

Table 12
Descriptive Comparison of the Treatment and Control Group by Gender
Mean NWEA Reading Posttest Scores (Adjusted for Pretest Performance)

Group	Gender	Number of Students	Posttest Scores	
			Mean	Standard Deviation
Control	Female	77	185.34[a]	18.03
	Male	94	183.93[a]	15.32
Treatment	Female	79	187.99[a]	18.43
	Male	84	186.66[a]	14.63

Discussion

Summary. The results indicate that providing CORE Professional Development for teachers is an effective tool for developing third-grade student reading skills. Students in classes in which teachers received CORE professional development showed greater reading skills growth than comparable students in classes in which teachers did not receive CORE professional development.
We examined the differences in reading skills growth between matched groups of students in classes with teachers receiving CORE professional development students in classes with teachers not receiving CORE professional development, within a quasi-experimental design using the NWEA MAP Reading Skills assessment as an outcome measure. We found an effect size for CORE professional development of .17. There was no evidence that CORE professional development was more or less effective for girls and boys or based on ESL status.

Context for success. This .17 effect size is particularly notable given that the professional development treatment was provided to teachers and is not a direct treatment delivered to students. While ultimately it is likely to manifest as a direct treatment to students (through instruction), professional development is a mediated treatment—a treatment one step removed from actual student instruction. That CORE professional development produced about a fifth of a standard deviation greater reading skills growth, even though it is one step removed from direct student instruction is impressive.

One should use caution in overgeneralizing these findings. This is a single study and additional study is necessary to confirm what we found here. CORE has a broader research plan and is embarking on several other studies to further explore the impact of CORE professional development.

Conclusion. In conclusion, the findings of this study demonstrate that the CORE Professional Development program is effective in facilitating student reading skills growth. While other factors certainly contribute to student achievement, (e.g. curriculum and instruction) this study demonstrates that the professional development provided by CORE made the difference in student achievement.