The Impact of CORE Professional Development on First Grade Student Reading Skills Growth

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SEGMEASUREMENT
BUILDING BETTER ASSESSMENTS / EVALUATING PRODUCT EFFECTIVENESS

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Executive Summary

SEG Measurement studied the effectiveness of the Consortium on Reaching Excellence in Education (CORE) professional development and technical assistance provided to teachers implementing the SIPPS Reading Foundational Skills Program along with their broader English Language Arts instruction. The research was conducted in First Grade classrooms in the Pajaro Valley Unified School District during the 2018-2019 school year.

The primary question addressed was: "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?" To answer this question, we compared student reading skill growth in classes with teachers receiving CORE professional development (treatment group) to student reading skill growth in classes with teachers that did not receive CORE professional development (control group).

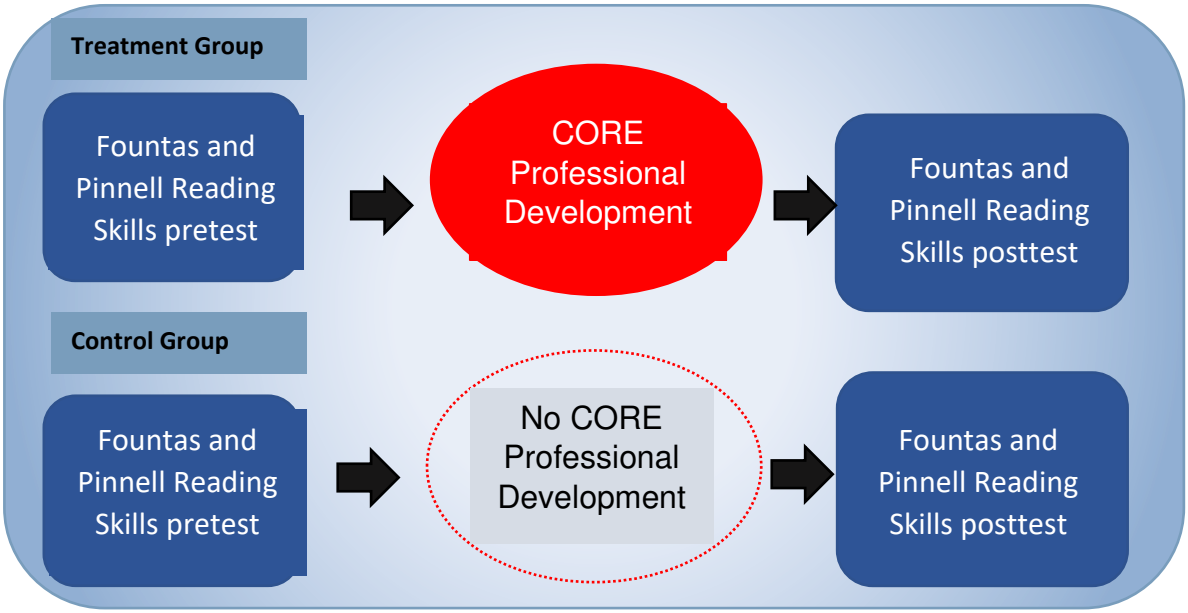
The primary question addressed was "Do students in classes with teachers receiving CORE professional development achieve greater reading skill gains than students in classes with teachers who do not receive CORE professional development?"

Study Design

The study was designed to meet the requirements of the Every Student Succeeds Act (ESSA) guidance for Moderate Evidence (U.S. Department of Education, 2016). The study employed a quasi-experimental design with pre and post testing of treatment and control group students. The reading skills of groups of students matched on initial ability and background 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 Fountas and Pinnell's Reading Level Assessment at the beginning of the school year (pretest) and at the end of the school year (posttest).

The study employed a quasi-experimental design with pre and post testing of treatment and control group students.

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 reading instruction and to implement the SIPPS Foundational Skills Reading program in the Pajaro Valley Unified School District.

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 were implemented with fidelity.

Students were matched on a composite propensity score reflecting initial ability, gender, ethnicity, Free or reduced lunch status, and ESL (English as a Second Language) status

Sampling

The treatment and control groups were drawn from the approximately 1300 First Grade students in the District. The treatment group was composed of the approximately 475 First Grade students in the eight CORE implementation schools. A matched group of approximately 475 First Grade students was selected from the remaining Pajaro First Grade students using propensity score

matching. Students were matched on a composite propensity score reflecting initial ability, gender, ethnicity, Free or reduced lunch status, and ESL (English as a Second Language) status.

Analysis

We compared student reading skills growth in classes with teachers participating in CORE Professional Development (treatment group) to student reading skills growth in classes with teachers who did not participate in CORE (control group) to evaluate the effectiveness of CORE Professional Development. We used Analysis of Covariance (ANCOVA) to examine differences in student reading skills between the treatment and control groups compared to the reading skills growth in the control group. ANCOVA can be used to examine the differences in growth between a treatment and control group, while adjusting for any initial differences in reading ability.

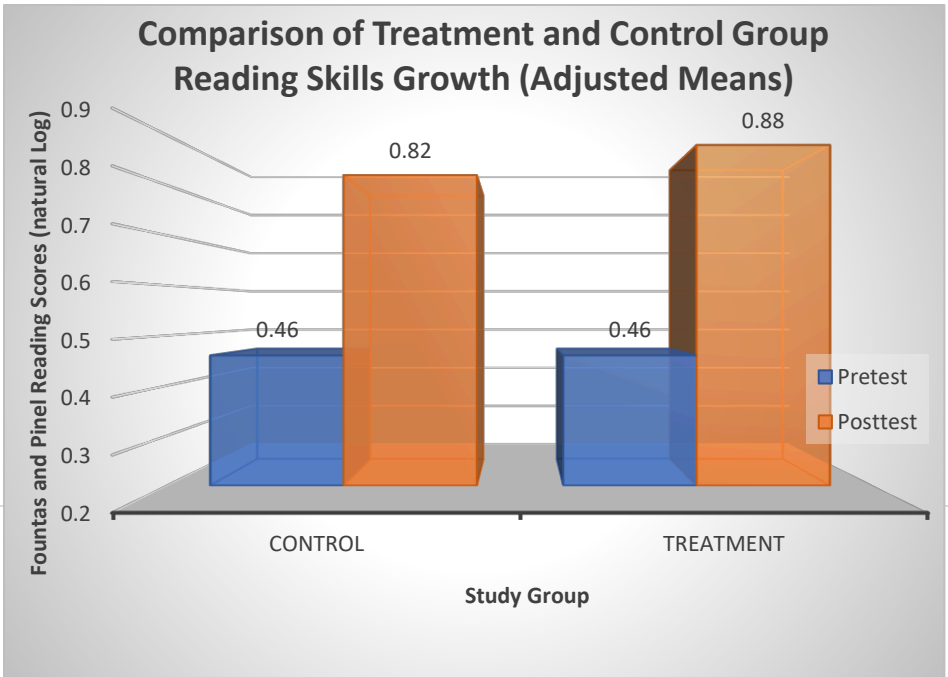
Student reading skills growth in the treatment group was compared to the reading skills growth in the control group using Analysis of Covariance (ANCOVA).

We also examined the two study groups along with several student characteristics to see if any of those characteristics interacted with participation in CORE to enhance or moderate the effects of CORE alone.

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 ($F = 6.51$, $df=1/947$; $p=.011$ Effect Size=.15). The mean reading posttest score for the treatment group was .88 while the control group mean reading posttest score was .82 or about a fifth of a standard deviation more growth in reading skills.

Figure 1



We conducted a series of analyses to determine if there were any student characteristics that interacted with the effect of CORE participation. There were no significant interactions between study group and gender, ethnicity, free or reduced lunch status or ESL status. Participation in CORE Professional Development was equally effective regardless of these background characteristics.

Conclusion

Students in first-grade classes with teachers who participated in CORE professional development and technical assistance showed substantially greater improvement in reading skills than students in classes with teachers who did not participate in CORE. There was no meaningful interaction between CORE and the student background characteristics studied.

In conclusion, This study demonstrates that teacher participation in CORE Professional Development is effective in facilitating student reading skills growth.

This study demonstrates that teacher participation in CORE Professional Development is effective in facilitating student reading skills growth. When viewed in combination with the two prior studies finding similar results at grades two and three, there is convergent evidence that providing CORE Professional Development to Teachers has a positive impact on elementary student reading skills growth.

The Impact of CORE Professional Development on First Grade Student Reading Skills Growth (DRAFT)

Overview

SEG Measurement studied the effectiveness of CORE professional development and technical assistance provided to teachers implementing the SIPPS Reading Program in Pajaro Valley Unified School District. CORE began providing professional development, including the Reading Course, during the 2017-2018 school year and has increased the scope of the implementation with each subsequent school year. During the first year (2017-2018) CORE worked with 3 of Pajaro's 17 elementary schools; in year two, CORE worked with 9 elementary schools. CORE worked with all 17 schools in the third year of implementation.

This is the third in a series of studies examining the effectiveness of CORE Professional Development and the impact of providing this professional development on student reading skills growth. The first study examined third grade classrooms in the eight CORE-participating schools during the 2018-2019 school year The second study examined CORE impact in second grade, finding that students in classes with teachers participating in CORE Professional Development showed greater growth in reading skills than did students in classes where teachers did not receive CORE Professional Development.

The third study described in this report was conducted in First Grade classrooms in the nine CORE-participating schools during the 2018-2019 school year. This study explores the impact of teacher participation in the CORE professional development and support at the first-grade level. First Grade student reading skill growth in those classes with teachers who were provided CORE professional development was compared to student reading skill growth in classes with teachers who did not receive CORE professional development. First-grade student reading skill growth in those schools receiving CORE professional development services was compared to reading skill growth for a matched group of first-grade students drawn from the remaining pool of First Grade classrooms in the District not receiving CORE professional development services.

Research Questions

The primary 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 who do not receive CORE professional development? The specific operational questions addressed to answer this are:

1. Do students in First Grade classrooms in which teachers receive CORE professional development services show larger gains in reading skills than comparable students in

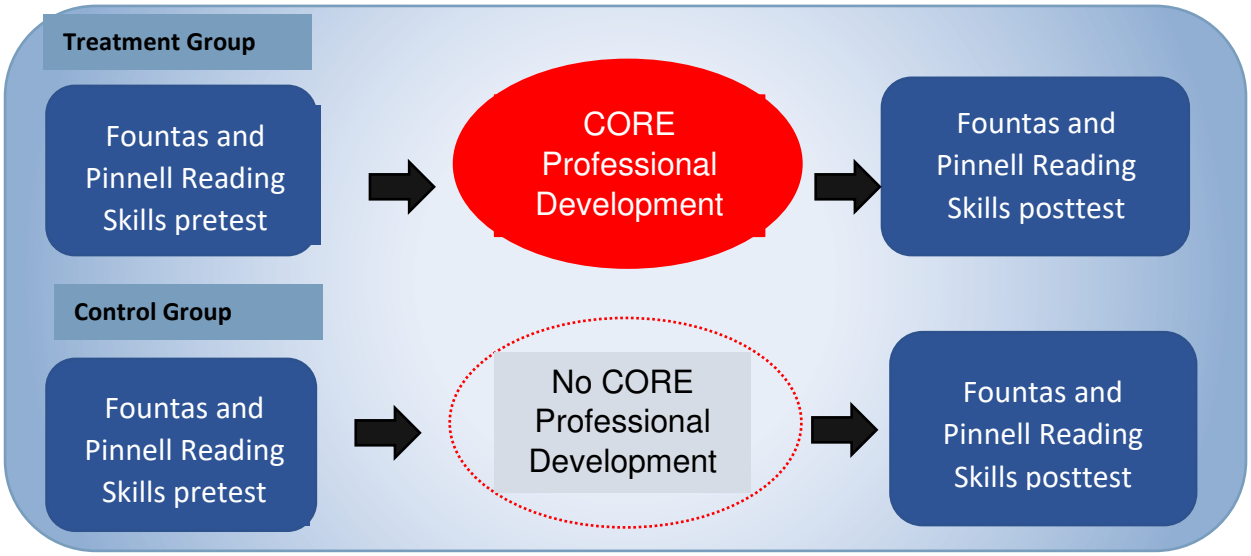
First Grade classrooms in which teachers do not receive CORE professional development? (main effect)

2. Is the impact of CORE professional development on reading skills growth 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.

Figure 3: Study Design



Treatment: CORE Professional Development

For 25 years the Consortium on Reaching Excellence in Education (CORE) has provided services to more than 150,000 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 reading instruction and to 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 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 primary grade ELA SIPPS implementation. The work began with 3 schools, focusing on K-2 and has increasingly moved to include third grade and implementations at all 17 district elementary schools.

Measures

Student information (e.g., gender, free and reduced lunch eligibility) was obtained from Pajaro Valley Unified School District. The District collects and maintains this information and provided this background information for each participating student.

Reading skills were measured using the Fountas and Pinnell level assessments. Fountas and Pinnell is a widely used and well-respected reading instruction program. The instructional materials are accompanied by assessments designed to identify the correct Fountas and Pinnell instructional level to place the student into at the outset of instruction, monitor changes in student levels to ensure that instructional materials are well aligned using a text level gradient approach and to evaluate students end of year reading level .

The text level gradient approach along with other properties of the Fountas and Pinnell Assessments make them difficult to use for this research. However, according to the Publisher, "The Fountas & Pinnell Benchmark Assessment Systems are accurate and reliable tools to identify the instructional and independent reading levels of all students and document student progress through one-on-one formative and summative assessments." Test-Retest reliability was recently reported to be .93 (Fountas and Pinnell).

SEG Measurement used the initial level assessment results as a pretest and the end of year level assessment results as a reading outcome measure, after transforming the data. In order to

render these assessments more suitable for this research, SEG Measurement transformed the raw Fountas and Pinnell results.

First, since the assessment results are reported as a letter score from A to Z corresponding to the Fountas and Pinnell reading levels, we converted them into numerical scores with 1 indicating low reading levels below A, 2 indicating level A, 3 indicating Level B, etc..

Second, a review of the distribution of 1st grade scores showed significant non-linearity, with poor model fit for the statistical tools used to compare the treatment and control groups. The data plot revealed an exponential progression with rapid non-linear growth. Examination of the model fit with the untransformed data showed significant model misfit.

Several transformations were examined in an effort to linearize the data; as would be expected, a logarithmic transformation created a near linear progression. Moreover, an examination of model fit for the ANOVA/ANCOVA using the logarithmic transform revealed a well-fitting model. The log was used for all difference and relational tests.

Data Collection

In December 2019, Pajaro Valley Unified School District provided SEG Measurement with a data file containing the reading assessment data and background information for all 2018-First Grade students in the District. For each first-grade student, the data file provided:

- Student name
- Student ID
- School
- Teacher
- Gender
- Ethnicity
- ESL status
- Free or reduced lunch eligibility
- Fall 2018 Fountas and Pinnell reading score
- Spring 2019 Fountas and Pinnell reading score

Sampling

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

Sample. There are approximately 1,336 First Grade students in the Pajaro Valley Unified School About 1025 of the first grade students had a reading pretest score due to student mobility (arriving during the school year following pretesting) or student absence (not present for

pretesting) Following the matching (see below) approximately 950 students remained for analysis. One half of those participating were in the treatment group and one half were in the control group.

The treatment group was initially composed of the approximately 500 First Grade students with pretest scores in the eight CORE implementation schools, with teachers receiving CORE Professional Development. A matched control group was selected from the remaining Pajaro First Grade students using propensity score matching. A logistic regression-based propensity score model was used. Students were matched using the composite propensity score based on initial ability, gender, ethnicity, ESL status and free or reduced lunch status. Sampling was done without replacement and matches were required to be within 5% of the propensity score.

We examined the two groups to evaluate their comparability.

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 about one third of a standard deviation apart (.35 SD). This is within the convention suggesting that treatment and control groups should be no more than one half of a standard apart with respect to ability.

Table1
Comparison of Initial Ability of Treatment and Control Group Sample

Study Group	Mean	N	Std. Deviation
Control	2.44	512	2.395
Treatment	3.02	513	2.782
Total	2.73	1025	2.611

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=1.062; df=1; p=.303).

Table 2
Comparison of Gender
for Treatment and Control Group Samples

Study Group		Gender		Total
		Female	Male	
Study Group	Control	263	249	512
	Treatment	280	233	513
Total		543	482	1025

Ethnicity. The ethnicity of the two study groups was similar; more than 90% of the students in both study groups were Hispanic. There were no significant differences in ethnic distribution of the study groups (chi square=5.7182; df=5; p=.335).

Table 3
Comparison of Ethnicity for Treatment and Control Group Samples

Study Group		Ethnicity						Total
		Asian	Black or African American	Filipino	Hispanic	Multiple	White	
Study Group	Control	2	0	0	474	1	35	512
	Treatment	1	1	3	475	3	30	513
Total		3	1	3	949	4	65	1025

Free and Reduced Lunch. There was a significant difference in the distribution of free and reduced lunch eligibility (chi square=8.507; df=2; pp=.014). While the treatment group and control group were functionally similar in distribution of students with free or reduced lunch eligibility, the Control group had a somewhat greater number of students eligible for free lunch than those in the Treatment group.

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

Study Group		Free and Reduced Lunch Status			Total
		Not Eligible	Reduced Lunch	Free Lunch	
	Control	119	41	352	512
	Treatment	154	51	308	513
Total		274	92	660	1025

ESL Status. There were no significant differences in the ESL classification of the study groups (chi square=2.859; df=1; p<.091).

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

Study Group		ESL Status		Total
		No	Yes	
Study Group	Control	195	222	512
	Treatment	222	244	513
	Total	419	608	1025

Attrition. There were approximately 1336 first grade students that were enrolled in the Pajaro District at some point during the school year. To be eligible for inclusion in the study analyses, students needed to have both a pretest and postest reading skills score., Approximately 350 of those students did not have both a beginning and end of school year reading skills test score. This is primarily the result of student mobility—students arriving in the district after the initial reading skills assessment administration and those who left the district before the end of school year assessment. An additional 152 students could not be matched through the propensity score matching. The final matched sample for the analysis included 512 treatment group and 513 control group students.

Data Analysis/Results

The effectiveness of the CORE Professional Development was evaluated. Student reading skills growth in the treatment group was compared to student 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 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, we examined the overall differences in reading skills between the treatment and control group (main effects) Then, we explored whether or not teacher participation in CORE professional development was more effective for select population subgroups, examining the interaction between study group and student characteristics.

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 development (F = 6.51, df=1/947; p=.011 Effect Size=.15). The treatment group achieved a mean reading skills posttest score of .88, while the control group achieved a mean reading skills posttest score of .82. These results are shown in Tables 6and 7 and Figure 4.

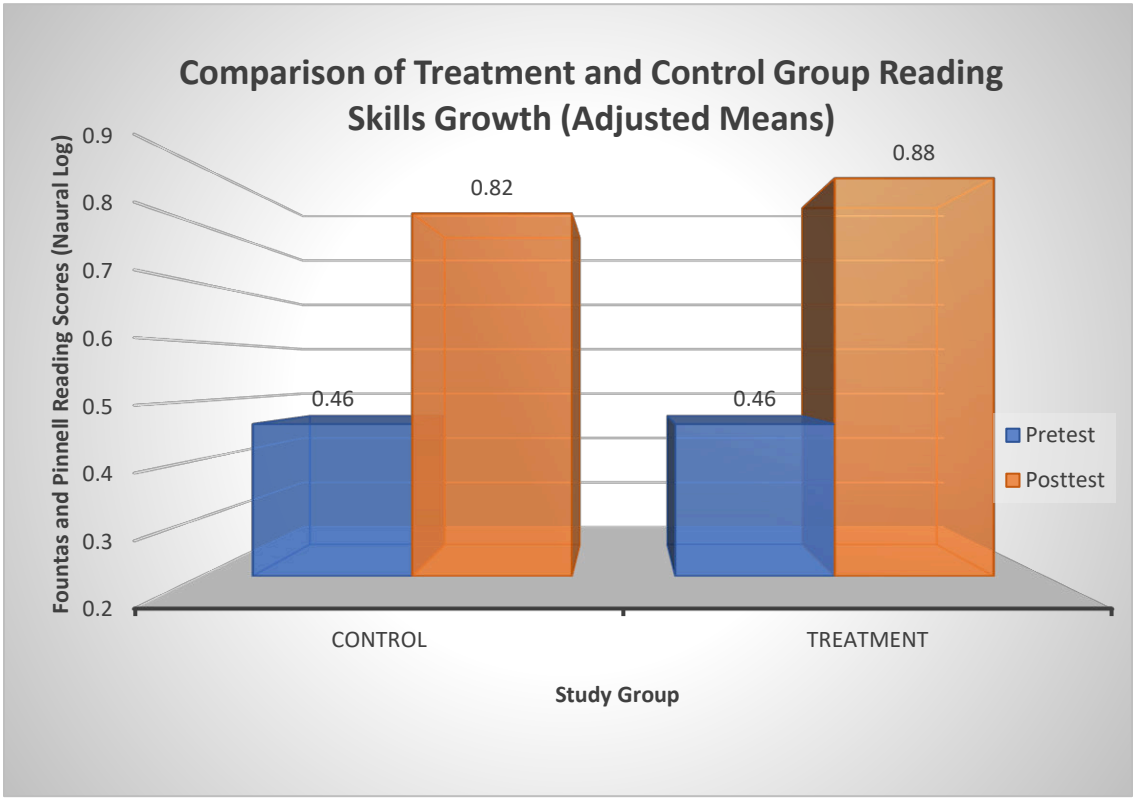
Table 6
ANCOVA of the
Treatment and Control Group Fountas and Pinnell Reading Posttest Scores

Source	Type III Sum of Squares	Df	Mean Square	F	Significance
Corrected Model	34.295[a]	2	17.147	504.11	.001
Intercept	100.058	1	100.058	2941.56	.001
Reading Pre Assessment	33.377	1	33.377	981.23	.001
Study Group	.221	1	.221	6.51	.011
Error	32.144	945	.034		
Total	755.693	948			
Corrected Total	66.439	947			

Table 7
Descriptive Comparison of the Treatment and Control Group
Fountas and Pinnell Reading Posttest Scores (Adjusted for Pretest Performance)

Group	Number of Students	Posttest Scores	
		Mean	Standard Deviation
Control	476	.82	.27
Treatment	472	.88	.25
Total	948	.86	.26

Figure 4



Interaction Between Study Group and Student Characteristics

SEG Measurement examined several student background characteristics and Study Group Membership to determine if CORE professional development interacted with student characteristics to moderate or enhance the impact of CORE professional development on reading skills development.

We examined the interaction between Study Group and Gender, Ethnicity, ESL status, and Reduced Lunch Status.

Interaction between Study Group and Gender. There was no significant interaction between Study Group and Gender (F=.01, df=1/943, p=..945) suggesting that CORE Professional Development was equally effective at achieving reading skills growth for both boys and girls.

These results appear in Tables 8 and 9

Table 8
ANCOVA of the
Treatment and Control Group by Gender
Fountas and Pinnell Reading Posttest Scores

Source	Type III Sum of Squares	Df	Mean Square	F	Significance
Corrected Model	34.299[a]	4	8.575	251.59	.001
Intercept	97.886	1	97.886	2872.02	.001
Reading Skills Pretest	32.677	1	32.677	958.75	.001
StudyGroup	.223	1	.223	6.55	.011
Gender	.004	1	.004	.13	.723
StudyGroup * Gender	.000	1	.000	.01	.945
Error	32.140	943	.034		
Total	755.693	948			
Corrected Total	66.439	947			

Table 9
Descriptive Comparison of the Treatment and Control Group by Gender
Mean Fountas and Pinnell Reading Posttest Scores
(Adjusted for Pretest Performance)

	Gender	Number of Students	Mean	Standard Deviation
Control	**Male**	246	.836	.286
	Female	230	.839	.261
Treatment	**Male**	260	.866	.281
	Female	212	.871	.203

Interaction between Study Group and Ethnicity. There was a significant interaction between Study Group and Ethnicity (F =.087, df=109/947; p=.967). CORE Professional Development was equally effective at achieving reading skills growth for all ethnic groups. Caution should be used in interpreting results for ethnicity, as more than 90% of the treatment and control group were Hispanic.

These results appear in Tables 10 and 11.

Table 10
ANCOVA of the
Treatment and Control Group by Ethnicity
Fountas and Pinnell Reading Posttest Scores

Source	Type III Sum of Squares	Df	Mean Square	F	Significance
Corrected Model	34.404[a]	10	3.440	100.630	.000
Intercept	5.590	1	5.590	163.491	.000
Reading Pre Test	31.567	1	31.567	923.299	.000
StudyGroup	.005	1	.005	.142	.706
Ethnicity	.093	5	.019	.544	.743
StudyGroup * Ethnicity	.009	3	.003	.087	.967
Error	32.035	937	.034		
Total	755.693	948			
Corrected Total	66.439	947			

Table 11
Descriptive Comparison of the Treatment and Control Group by Ethnicity
Mean Fountas and Pinnell Reading Posttest Scores (Adjusted for Pretest Performance)

Study Group	Ethnicity	Number of Students	Mean	Standard Deviation
Treatment	**Asian**	**2**	**.816**	**.103**
	Hispanic	**438**	**.835**	**.275**
	Two or More Races	**1**	**.875**	**.**
	White	**35**	**.861**	**.257**
Control	**Asian**	**1**	**.928**	
	Black or African	**1**	**.617**	**.**
	Filipino	**3**	**.844**	**.082**
	Hispanic	**440**	**.868**	**.252**
	Two or More Races	**2**	**.823**	**.056**
	White	**25**	**.892**	**.121**

Interaction between Study Group and ESL Status. There was no significant interaction between Study Group and ESL status (F =1.294, df=1/947; p=.256). Providing Core Professional Development to teachers was no more or less effective for students classified as ESL.

These results appear in Tables 12 and 13

Table 12
ANCOVA of the
Treatment and Control Group by ESL Status
Fountas and Pinnell Reading Posttest Scores

	Type III Sum of Squares	Df	Mean Square	F	Significance
Corrected Model	34.449[a]	4	8.612	253.868	.000
Intercept	81.182	1	81.182	2393.058	.000
PreTest	25.639	1	25.639	755.792	.000
Study Group	.177	1	.177	5.218	.023
ESLStatus	.111	1	.111	3.260	.071
StudyGroup * ESLStatus	.044	1	.044	1.294	.256
Error	31.990	943	.034		
Total	755.693	948			
Corrected Total	66.439	947			

Table 13
Descriptive Comparison of the Treatment and Control Group by ESL status
Mean Fountas and Pinnell Reading Posttest Scores (Adjusted for Pretest Performance)

Study Group	ESL Status	Number of Students	Mean	Standard Deviation
Control	**No**	183	.861	.219
	Yes	293	.822	.278
Treatment	**No**	196	.875	.219
	Yes	276	.864	.250

Interaction between Study Group and Free and Reduced Lunch Eligibility. There was no significant interaction between Study Group and Free or Reduced Lunch Eligibility (F =1.281, df=2/947; p=..278). This indicates that providing CORE Professional Development to teachers was equally effective in improving the reading skills of students regardless of their eligibility for free or reduced lunch.

These results appear in Tables 14 and 15

Table 14
ANCOVA of the
Treatment and Control Group by Free or Reduced Lunch Eligibility
Fountas and Pinnell Reading Posttest Scores

Source	Type III Sum of Squares	Df	Mean Square	F	Significance
Corrected Model	34.521[a]	6	5.753	169.618	.000
Intercept	80.965	1	80.965	2386.945	.000
Reading PreTEst	33.316	1	33.316	982.181	.000
StudyGroup	.030	1	.030	.882	.348
FreeandReducedLunchStatus	.140	2	.070	2.066	.127
StudyGroup * FreeandReducedLunchStatus	.087	2	.043	1.281	.278
Error	31.919	941	.034		
Total	755.693	948			
Corrected Total	66.439	947			

Table 15
Descriptive Comparison of the Treatment and Control Group
by Free or Reduced Lunch Eligibility
Mean Fountas and Pinnell Reading Posttest Scores (Adjusted for Pretest Performance)

Group	Gender	Number of Students	Posttest Scores	
			Mean	Standard Deviation
Control	No Free or Reduced Lunch	101	.848	.232
	Reduced Lunch	41	.894	.231
	Free Lunch	334	.827	.289
Treatment	No Free or Reduced Lunch	132	.854	.280
	Reduced Lunch	46	.890	.264
	Free Lunch	294	.871	.237

Discussion

This study examined the impact of teacher participation in CORE professional development and technical assistance on student reading skill growth. Students in classes with teachers who participated in CORE professional development and technical assistance showed substantially greater improvement in reading skills than students in classes with teachers that did not participate in CORE.

The positive impact of CORE Professional Development was consistent across several student background characteristics (gender and ethnicity) and classification as ESL or Eligibility for free or reduced lunch.

These results indicate that providing CORE Professional Development for teachers is an effective tool for developing first-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. These results suggest that providing CORE professional development and technical assistance to teachers contributes to student reading skills growth.

Study Design. Reading skills growth for students in classes with teachers participating in the CORE professional development and support and students in those in classes with teachers that did not participate in CORE professional development were compared. This comparison was made within a quasi-experimental design with matched groups of students; both groups of students completed the FOUNTAS AND PINNELL Reading Skills assessment as a pretest of reading skills and a posttest of reading skills. The two study groups were matched with respect to initial ability and student characteristics; this was a highly powered sample with more than 900 matched students included in the analyses.

Using ANCOVA, the growth in reading skills was compared, adjusting for any potential differences in initial reading skill revealed by the pretest. A second set of analyses examined the impact of the treatment along with several student characteristics (interaction) to see if any of those characteristics interacted with participation in CORE treatment and if any of those characteristics enhanced or moderated the effect seen when looking at CORE alone. Again, we used ANCOVA to look at CORE participation and each student characteristic to see how this enhanced or moderated the impact of CORE participation on student reading skill growth.

Results. Students in the treatment group with teachers who participated in CORE showed significantly greater growth in reading skills than did the control group students with teachers who did not participate in CORE ((F = 6.51, df=1/947; p=.011 Effect Size=.15)). Students in the treatment group showed about a fifth of a standard deviation more growth in reading skills than did the control group students. There were no significant interactions between participation in CORE Professional Development and student gender, ethnicity, free and reduce lunch status, and ESL

Context for success. As we observed for the second and third grade studies reported earlier, the effects observed are particularly strong given the context of the treatment examined. The overall effect size (.15) for CORE 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 in 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. Given that it is one step removed from direct student instruction this result is impressive.

The positive impact of Core Professional Development found here is consistent with the earlier second and third grade studies. Still one should use caution in overgeneralizing these findings. Additional research currently underway with a larger sample and multiple grade levels will help validate what we found in this study.

Conclusion. In conclusion, this study demonstrates that teacher participation in CORE Professional Development is effective in facilitating student reading skills growth. While other factors certainly contribute to student achievement, (e.g. teacher characteristics, student characteristics, curriculum and instruction), this study demonstrates that CORE professional development and technical assistance can make a significant difference in first grade student reading skills.

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