



Impact of the Lexia® Core5® Reading Program on Students with Reading Difficulties

RESEARCH BRIEF

Lisa B. Hurwitz, PhD, &
Kirk P. Vanacore, MA

research@lexialearning.com

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Lexia Research Brief

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Study Highlights

ESSA **STRONG** LEVEL

This evaluation is a gold standard, randomized control trial (RCT) that meets ESSA standards for **STRONG** research — the highest level of evidence outlined by federal law.



After using Core5 for the school year, students were **2x** more likely than non-users to be proficient readers.



Core5 was **64% more effective** than comparable programs as measured by standardized assessment growth.



All participants in this study were identified by the district as having **reading difficulties** at the beginning of the school year.

Background

The Lexia® Core5® Reading adaptive blended learning program (Core5) is designed to supplement the reading instruction of all students in grades preK-5, including students with reading difficulties. Core5 includes online activities and offline paper-and-pencil resources designed to promote phonological awareness, phonics, structural analysis, automaticity/fluency, vocabulary, and comprehension. Core5's effectiveness has been demonstrated for a variety of student populations via 20 peer-reviewed publications.¹

The current study evaluated Core5's effectiveness for elementary school students with documented reading difficulties. This study was designed to meet the criteria for **strong** research as outlined by the Every Student Succeeds (ESSA) act.² Under ESSA, only "evidence-based" interventions can be purchased with certain federal funds, including Title I and Comprehensive Support and Improvement grants. ESSA outlines a framework for choosing programs backed by evidence of effectiveness.

Strong research is the highest level of evidence in this framework. Programs backed by **strong** evidence have been evaluated via well-designed and implemented experimental research studies, with students randomly assigned to use either a target program or receive alternative instruction.

STRONG RESEARCH

is the highest level of evidence
under ESSA.

¹ See Lexia Learning. (2020). *Evidence-based, research-proven: Measuring Lexia's impact*. Retrieved from <https://www.lexialearning.com/why-lexia/research-proven>

² Every Student Succeeds Act (ESSA), Pub. L. 114-95, 114 Stat. 1177 (2015-2016).

Method

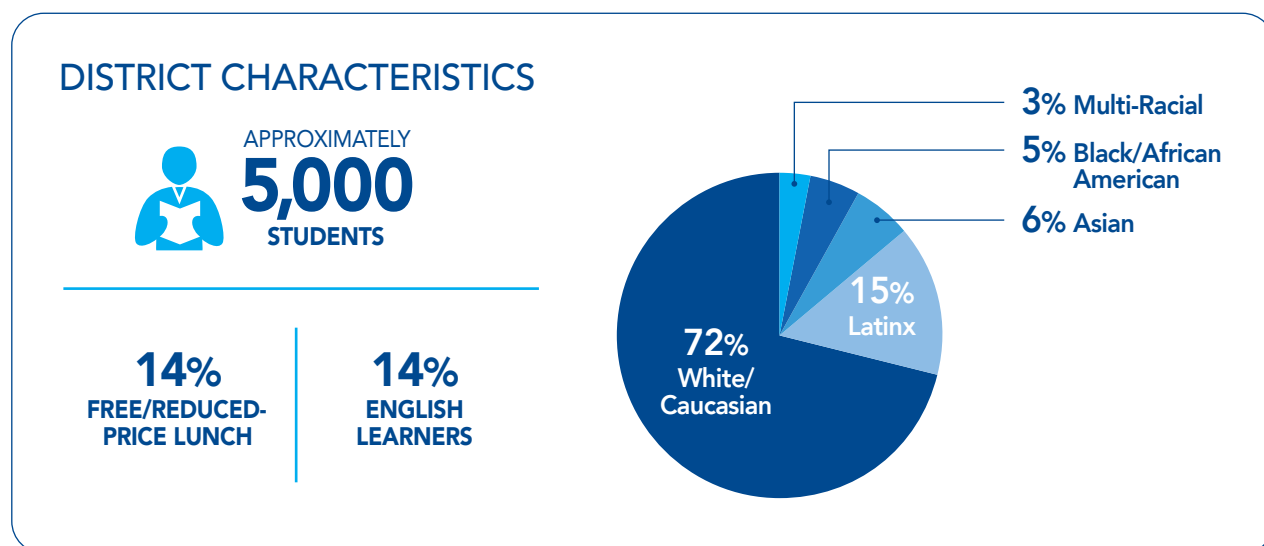
Study Design

At the beginning of the school year after a Fall reading assessment, 3 schools (65 students with reading difficulties) were randomly assigned to a treatment group that would use Core5 during supplemental reading instruction. An additional 2 schools (50 students with reading difficulties) were randomly assigned to a control group and were tasked with delivering supplemental reading instruction without Core5 (business as usual).³ Towards the end of the school year, all of these students participated in a Spring reading assessment.

Sample

For this study, Lexia partnered with a mid-sized school district located in the Chicago metropolitan area.

The district had a one-to-one iPad program for students in grades 1 and above. Students in grades 3 and above were allowed to take home iPads for homework purposes. In Kindergarten, students had access to shared devices in the classroom.



Twenty (20) teachers participated in the study. Of these, 11 provided the research team with information on their teaching practices and demographics. These teachers were highly experienced. All but one had Masters degrees, and 82% (9 teachers) had more than 20 years of teaching experience. All were White females.

³ In both the Core5 and control schools, teachers used commercial reading curricula during supplemental sessions. The district did not mandate a uniform curriculum, and individual schools had liberty to select programs/interventions. All of the teachers in both the Core5 and control schools who provided survey data used at least one program by Wilson: Foundations, Just Words, and/or Wilson Reading System. In addition, 3 control teachers used Fountas and Pinnell Leveled Literacy Intervention System and 5 teachers (4 treatment and 1 control) used Words Their Way. All treatment teachers also used Core5.

As part of the main reading curriculum, all students also used Schoolwide's reading program. In addition, many students used Freckle and Epic Reading during regular education reading sessions, and a small number used IXL Language Arts, Read Theory, ReadWorks, Learning Ally, and Tumble Books.

This study focused on 115 students in grades K-5 receiving supplemental instruction for reading difficulties.

STUDENT CHARACTERISTICS

Grade Level	Number of Students
K	8
1	6
2	9
3	24
4	35
5	33



115 K-5
STUDENTS WITH
READING DIFFICULTIES

Reading Achievement Measure

Reading achievement was tested with Measures of Academic Progress® (MAP) Growth™ Reading. MAP is a computer-adaptive assessment that students typically complete in about 45-60 minutes. For grades K-2, MAP measures a) Foundational Skills (phonological awareness and phonics), b) Vocabulary Use and Functions, c) Literature and Informational Text, and d) Language and Writing. For grades 3-5, MAP measures a) Word Meaning and Vocabulary Knowledge, b) Understanding and Integrating Key Ideas and Details for Literature and Informational Text, and c) Understanding and Interpreting Craft and Structure for Literature and Informational Text. MAP generates a composite scale score in Rasch Units (RIT), which can range from 100 to 350, as well as a percentile score. Students who scored at or above the 40th percentile at either time point were categorized as “proficient” readers.⁴

⁴ The 40th percentile cut-off is based on precedent set by Petscher, Y., & Kim, Y. (2011). Efficiency of predicting risk in word reading using fewer, easier letters. *Assessment for Effective Intervention*, 37, 17-25. doi:10.1177/1534508411407761

Results

Core5 Usage

Students in the treatment group began using Core5 in mid-October and continued using it through the end of the school year, excluding weeks with district-wide holidays or standardized testing. On average, **students used Core5 for 24 weeks with 60 minutes of online work per week.**

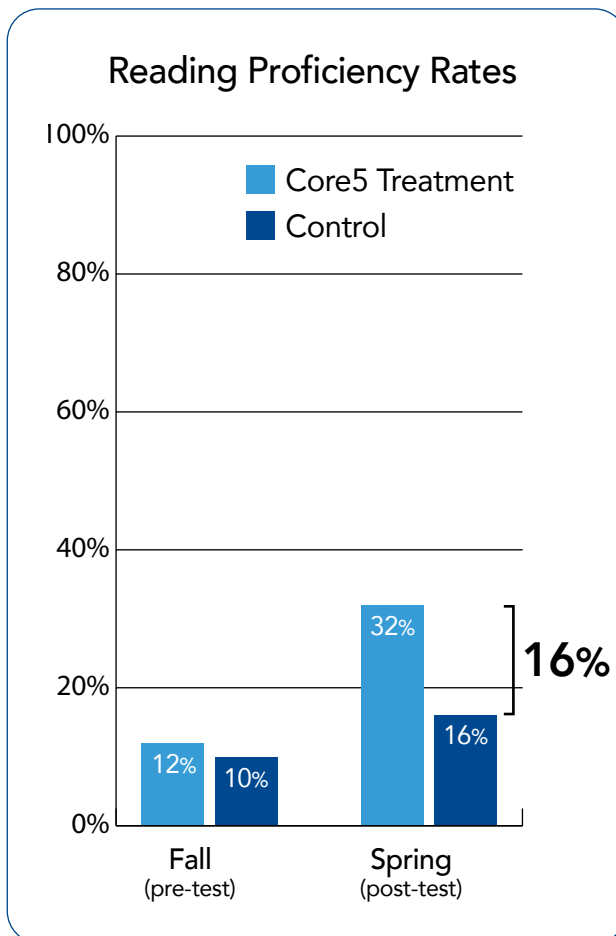
Reading Outcomes

Core5 users made solid progress towards achieving reading proficiency over the course of the school year. At the beginning of the school year before the research study commenced, students in the treatment and control schools earned similar MAP scores. Only about 1 in 10 students were reading proficiently across both groups.

After a year of Core5 use, students in the treatment group earned significantly higher scores on MAP than students in the control group – the equivalent of about 8 percentile points. The proportion of proficient readers in the control group remained fairly constant over the course of the school year. In contrast, about 1 in 3 Core5 users earned proficient scores in the Spring – **a 20% increase** over the course of the school year. At the end of the school year, Core5 users were twice as likely to be proficient readers compared to control students.

Researchers calculate a metric called an effect size (Cohen's *d*) to quantify the impact of an intervention. If treatment students receive higher scores than control students, Cohen's *d* will be positive, with larger Cohen's *d* estimates indicating a larger treatment effect. Previous research has found that the average reading intervention for similar student populations had an effect size of Cohen's *d* = .14.⁵ Cohen's *d* in this study is .23. This means that **Core5 was 64% more effective than comparable programs.**

See the Technical Appendix for more information on the calculation of these results.



Students who used Core5 for across the school year were **2x more likely** to be proficient readers.

Conclusion

We found that Core5 had a positive and statistically significant impact on the standardized reading scores of students with reading difficulties. Treatment students using Core5 were twice as likely to become proficient readers at the end of the school as control students who did not use Core5. The results of this study adhere to ESSA standards for **strong** research and provide valuable information for educational decision-makers. Results show Core5 is an effective supplement for an important at-risk population of readers.

Several program design characteristics may have contributed to Core5's effectiveness. Core5 provided systematic, sequential, and adaptive instruction across six areas of reading. Prior research points to the effectiveness of this instructional approach.^{6,7} The online component of Core5 was able to provide students multimodal audio and visual learning opportunities which may be more appealing than traditional print materials – features previous research suggests promote learning and engagement.⁶ Core5 also encouraged teachers to provide in-person support when program data made it clear that students were struggling to master specific skills, another program element noted as effective in prior research.⁷ Additionally, students may have derived satisfaction from completing levels in the online program and earning Certificates, which may have enhanced their reading motivation.⁶ Together, these features contributed to strong learning.

The results of this study indicate that Core5 is an effective tool to support students with reading difficulties. Skill deficits in elementary school have the potential to set this student population on a negative academic trajectory. Intervening in elementary school when students are still learning to read can have a profound impact on their school performance when later they are required to “read to learn.”⁸

⁵ Scammacca, N. K., Roberts, G., Vaughn, S., & Stuebing, K. K. (2015). A meta-analysis of interventions for struggling readers in grades 4-12: 1980-2011. *Journal of learning disabilities*, 48, 369-390. doi:10.1177/0022219413504995

⁶ Centre of Excellence. (2017). *Understanding dyslexia*. Manchester, UK: Centre of Excellence.

⁷ Kim, M. K., McKenna, J. W., & Park, Y. (2017). The use of computer-assisted instruction to improve the reading comprehension of students with learning disabilities: An evaluation of the evidence base according to the What Works Clearinghouse standards. *Remedial and Special Education*, 38, 233-245. doi:10.1177/0741932517693396

⁸ Fiester, L. (2013). *Early warning confirmed: A research update on third-grade reading*. Baltimore, MD: Annie E. Casey Foundation.

Technical Appendix

Below we provide descriptive information on students' MAP performance in the Fall (pre-test) and Spring (post-test).

	Fall MAP RIT Scores <i>M</i> (<i>SD</i>)	Fall MAP Percentile Scores <i>M</i> (<i>SD</i>)	Fall Map Proficiency % (<i>n</i>)	Spring MAP RIT Scores <i>M</i> (<i>SD</i>)	Spring MAP Percentile Scores <i>M</i> (<i>SD</i>)	Spring MAP Proficiency % (<i>n</i>)
Core5 Treatment (<i>n</i> = 65)	176.46 (19.53)	21.49 (17.39)	12% (8)	189.77 (16.31)	29.86 (25.00)	32% (21)
Control (<i>n</i> = 50)	173.68 (18.68)	19.92 (14.99)	10% (5)	185.02 (15.84)	22.52 (15.00)	16% (8)

To test for differences in Spring MAP RIT scores between the Core5 treatment and control group, we initially attempted to run a multi-level model that accounted for the nested structure of our dataset (i.e., students nested within schools). However, there was no variance at the school level after controls were added. Therefore, we ran an analysis of covariance (ANCOVA) model. We compared Spring MAP RIT scores across conditions while also controlling for Fall MAP performance and a series of student-level dichotomous indicators. The overall model was significant, $F(11, 103) = 11.89, p < .001, \eta^2 = .56$. Treatment students using Core5 scored significantly higher on MAP (adjusted $M = 192.36, SE = 1.71$) than control students (adjusted $M = 188.65, SE = 1.83, F(1, 103) = 5.03, p = .027, \eta^2 = .05$, Cohen's $d = .23$). Results were similar when the model was repeated for MAP percentile score (adjusted $M_{Treatment} = 35.47, SE = 2.61$ vs $M_{Control} = 27.30, SE = 2.75, F(1, 103) = 7.55, p = .007, \eta^2 = .07$, Cohen's $d = .55$).

We next ran a series of χ^2 and McNemar's tests to compare proficiency rates for Core5 treatment and control students at the two test points. The proportion of proficient readers did not differ between treatment and control students in the Fall $\chi^2(1, N = 115) = .15, p > .05$, Cramer's $V = .04$. In contrast, there were more proficient readers in the Core5 treatment group than the control group in the Spring, $\chi^2(1, N = 115) = 3.99, p = .046$, Cramer's $V = .19$. McNemar's tests show that the increase in proficiency rates was significant for the treatment group ($p = .001$) but not for the control group ($p > .05$).