

Product Evidence Base

# Lexia® Core5® Reading Correlational Research

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# Introduction

Lexia Learning has a long history of building digital programs to help students become proficient readers. For more than 40 years the company has focused solely on literacy. Today, Lexia provides a full spectrum of literacy solutions for both students and teachers. Included in the portfolio is Lexia Core5 Reading, a program designed to accelerate the acquisition of fundamental literacy skills for students in grades PreK–5. Core5 offers explicit instruction in six areas of reading and includes "Assessment Without Testing" technology which – as an application of Artificial Intelligence – provides teachers with in-program measures to help them plan instruction. As a blended learning program, Core5 integrates online activities with teacher-directed instruction targeting individual needs of students. This document summarizes correlational evidence from specialized customer evaluations. The goal is to establish the validity of Core5 in-program measures and provide evidence demonstrating the program's effectiveness as a classroom assessment of reading ability.

**Effectiveness** research focuses on how well a program works in real-world settings. **Efficacy** research uses experimental designs to control for confounding variables.

Research on the effectiveness of an instructional program considers its benefits in real-world, local settings. The effectiveness of Core5 is revealed in evaluation reports prepared by the Lexia Research team that are designed to address the specific needs and requests of individual school districts. These evaluation reports demonstrate how well measures obtained from performance in Core5 correlate with scores on the district's end-of-year reading test. Customized evaluations are negotiated between Lexia and individual districts. The resulting reports analyze data for students that use Core5 for a full year, demonstrate fidelity of use, and include at least 100 students. Included in many of these reports are correlations between in-program variables and external tests.

Research on *program effectiveness* relates to research on *program efficacy* in that both intend to assess the impact of a program. However, while effectiveness research asks how well a program works in real-world settings, efficacy research utilizes experimental designs and examines how well the program works with controls in place (Rossi et al., 2003). Both types of research are necessary to understand the types of effects a program is likely to have. The Correlation Reports on Core5 effectiveness serve to complement the efficacy research summarized in the [Core5 Reading Efficacy Research](#) document.

# Key Findings

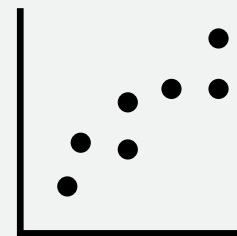
Multiple evaluations of customers' Core5 implementations, consistently show:

- **High to medium correlations between students' progress in Core5 and common interim and summative tests.**

Correlations range from 0.44 to 0.67. Data include students who used the online portion of Core5 for at least 20 weeks and who met their weekly usage targets for at least 50% of those weeks.

- **Uniformly positive relationships across districts and states.**

To date, Lexia researchers have conducted over 70 custom evaluations with schools and districts across more than 20 states. These data from over 200,000 students demonstrate consistent positive relationships between Core5 progress measures and performance on external tests.



## Interim Tests

- MAP Growth Reading
- DIBELS 8
- aimswebPlus
- Star Reading
- i-Ready Diagnostic
- Star Early Literacy
- Acadience Reading

## Accountability Tests

- WIDA ACCESS (VA)
- Smarter Balanced ELA (CA, SD, WA)
- FAST ELA (FL)
- GMAS ELA (GA)
- ISAT (ID)
- IREAD-3 (IN)
- OST ELA (OH)
- MCAS ELA (MA)
- MCA ELA (MN)
- MAAP ELA (MS)
- EOG Reading (NC)
- NYS ELA (NY)
- TCAP ELA (TN)
- STAAR RLA (TX)
- SOL Reading (VA)
- WI Forward ELA (WI)

## Calculating Correlations

Schools and districts who purchase Core5 often want to know how measures in Core5 relate to scores on standardized tests of reading. To answer this question, Lexia researchers typically calculate a correlation, a numerical value which reflects the strength of relationship between Core5 program measures and student test scores. Positive correlations (ranging from 0 to 1) demonstrate that students who have good progress in Core5 tend to also have high test scores and students with weak progress in Core5 tend to have low test scores. Correlations close to 1 indicate a strong relationship; correlations near 0 indicate no relationship and are undesirable.

Across Lexia's research, we categorize correlations into three ranges: high (0.50 to 1.00), medium (0.30 to 0.49), and low (0.10 to 0.29). Correlations of 0.35 and above are considered to be strong evidence of effectiveness when evaluating reading assessments or programs ([Hemphill, 2003](#)). When interpreting the magnitude of correlations, it is important to note that many standardized tests used by school districts and states often address broad domains (e.g., English Language Arts) which include broader constructs than just reading. For this reason, we rarely expect to observe high correlations between Core5 progress and external measures of achievement, but, instead, we generally expect medium relationships.

Table 1 provides average estimates of correlations among measures in Core5 and scores on various standardized tests associated with reading. The correlations in Table 1 were derived from detailed evaluation reports created by the Lexia Research Team. Each row in the table summarizes results obtained for one test, which may have been administered in one or more locations. External tests are broadly divided into two categories – interim and summative tests ([Perie, Marion, and Gong, 2009](#)). Interim tests are often marketed as benchmark, diagnostic, formative, or predictive assessments, and they are typically administered during instruction to evaluate students' knowledge and skills relative to a specific set of academic goals to inform educator decisions or district policy. Summative (or accountability) tests are designed to measure students' attainment of state standards at specific points in time, and they are often accompanied by criterion-referenced levels of proficiency or performance. The correlations we present are based on both interim and summative tests administered at the end of the school year. Links are also provided to either the vendor website or the state website that describes the nature of the test in greater detail.

Table 1.

*Correlations among Core5 Progress Measures and Common Standardized Tests.*

Test	n Reports	Recent Year	Cor.	Sample Size
Interim Tests				
<a href="#">MAP Growth Reading</a>	13	22-23	0.64	57,195
<a href="#">DIBELS 8</a>	6	22-23	0.61	26,254
<a href="#">aimswebPlus</a>	5	22-23	0.63	8,658
<a href="#">Star Reading</a>	4	23-24	0.61	4,293
<a href="#">i-Ready Diagnostic</a>	3	23-24	0.67	7,456
<a href="#">Star Early Literacy</a>	2	23-24	0.44	1,466
<a href="#">Acadience Reading</a>	1	18-19	0.61	14,494
Summative Language Proficiency Tests				
<a href="#">WIDA Access</a>	2	22-23	0.55	7,664
Summative State Accountability Tests				
<a href="#">Smarter Balanced ELA</a>	3	23-24	0.63	3,646
<a href="#">Florida Assessment of Student Thinking (FAST) ELA</a>	2	23-24	0.57	6,143
<a href="#">Georgia Milestones Assessment System (GMAS) ELA</a>	1	20-21	0.59	2,271
<a href="#">Idaho Standards Achievement Test (ISAT) ELA</a>	1	17-18	0.62	206
<a href="#">Indiana Reading Evaluation and Determination (IREAD-3)</a>	1	17-18	0.65	862
<a href="#">Ohio State Test (OST) ELA</a>	1	15-16	0.52	1,388
<a href="#">Massachusetts Comprehensive Assessment System (MCAS) ELA</a>	1	17-18	0.43	645
<a href="#">Minnesota Comprehensive Assessments (MCA) ELA</a>	1	23-24	0.58	329
<a href="#">Mississippi Academic Assessment Program (MAAP) ELA</a>	1	20-21	0.58	353
<a href="#">North Carolina End-of-Grade (EOG) Reading Test</a>	4	22-23	0.59	15,338
<a href="#">New York State (NYS) ELA Test</a>	1	22-23	0.64	1,013
<a href="#">Tennessee Comprehensive Assessment Program (TCAP) ELA</a>	1	16-17	0.51	975
<a href="#">State of Texas Assessments of Academic Readiness (STAAR) ELA</a>	5	23-24	0.60	24,546
<a href="#">Virginia Standards of Learning (SOL) Reading Test</a>	3	22-23	0.59	10,441
<a href="#">Wisconsin Forward ELA</a>	1	17-18	0.52	2,590

The correlations presented in Table 1 are weighted averages of the Pearson correlations between students' end-of-year levels in Core5 and their scores on the test. At the request of customers, the Lexia Research team calculates correlations by grade and often by demographic subgroup. When there are multiple evaluations that involve a single test, we compute a single grade-specific weighted correlations for each test using two steps. First, we multiply each of the grade-specific correlations in a report by the number of students in that grade that contributed to that correlation estimate. Second, we divide by the total number of students in each grade across all evaluations with the same test. The resulting grade-specific correlations for each test are presented in the Appendix. To arrive at a single estimate of the average correlation between Core5 progress and scores on external tests, we follow a similar procedure to calculate weighted average correlations for each test across grades. All correlations in Table 1 fall in the medium range (0.4 to 0.6) and offer strong support for the local effectiveness of Core5 since these data are collected from various states and school districts across the United States.

## Evidence of Correlations as a Measure of Validity

Core5 is often used as part of teachers' classroom assessment practices. Classroom assessment consists of formative and summative evaluations of students that occur during the process of instruction. The notion of validity developed for large-scale testing programs is often misaligned with the goal of classroom assessment, which is to understand the role of assessment information in the ongoing classroom learning environment ([Brookhart, 2003](#)). According to the Standard for Educational and Psychological Testing (AERA, APA, & NCME, 2014), validity refers to "the degree to which evidence and theory support the interpretations of test scores for proposed uses of tests" (p. 11). Although large-scale tests and classroom assessments have different goals, some aspects of validity theory can be useful in developing a validity argument ([Kane, 2013](#)) for measures from instructional tools like Core5 that are designed to provide assessment information. Specifically, correlations between Core5 end-of-year levels and external tests presented in Table 1 provide evidence of *concurrent validity* – that is, how well Core5 measures relate to standardized test scores of reading ability collected at the same time.

The program measures in Core5 constitute elements of [Assessment Without Testing](#) (AWT). As one component of classroom assessment, these measures provide ongoing information about students' reading ability without the need to administer a test. Reliance on interim or summative tests often requires a separate testing event to collect information from students which may



then be used to inform instruction. AWT, on the other hand, provides teachers with information about students' reading ability via the online component of Core5 without the need to interrupt instruction to administer a test. This information can be used by teachers to tailor students' classroom experiences using offline lessons, create small instructional groupings, or identify additional scaffolds to support student learning.

Since its inception, Core5 has contained elements of Artificial Intelligence, which can be defined as “automation based on associations” ([U.S. Department of Education, Office of Educational Technology, 2023](#)). Core5 provides predictor scores (called Performance Predictors) for each student that are based on a student's monthly progress in the program and indicate the likelihood that the student will complete grade-level material by the end of the school year. Core5 predictor scores are automatically derived from a proprietary statistical model and reported to teachers at the beginning of each month. These interim measures can be used to monitor student progress and inform teachers about which students need added support during the school year. The auto placement and branching features in Core5 ([Baron et al., 2019](#)) are also automatic, personalized components of the program based on students' performance. Auto placement serves as a screening tool used to assign students to an appropriate starting level in Core5. When students experience difficulties in Core5, a branching algorithm automatically moves them to guided practice or, if necessary, a direct instruction mode in the program.

Core5 predictor scores, auto placement, and branching features are early applications of Artificial Intelligence in reading instruction.

The correlations presented in Table 1 provide evidence that progress within Core5 – as measured by end-of-year level – is associated with external tests of reading ability. Although these correlations do not provide direct insights into how teachers are using this information to guide instruction, they do suggest that there is a positive relationship between instruction that incorporates Core5 and students' reading ability. Future research will continue to advance a classroom assessment validity argument for Core5 measures by providing further evidence of concurrent validity and gaining greater insight – using quantitative data to support qualitative findings – on how educators are using Core5 to inform instruction.

## Appendix: Grade-Specific Correlations

Tables A1, A2, and A3 present grade-specific correlations for each assessment. In cases where multiple evaluations were conducted for customers (i.e., the number of reports is greater than 1), we take the weighted average of the reported correlation for each grade. In Table A4, we provide correlations for historical state summative accountability tests, which are no longer in use.

Table A1.

*Correlations with Common Interim Tests.*

Test	n Reports	Recent Year	Grade-Specific Correlation (Total Sample)					
			K	1	2	3	4	5
<a href="#">MAP Growth Reading</a>	13	22-23	0.53 (7412)	0.63 (10,474)	0.64 (12,823)	0.64 (11,476)	0.68 (8,114)	0.71 (6,896)
<a href="#">DIBELS 8</a>	6	22-23	0.55 (4827)	0.66 (7742)	0.62 (8150)	0.59 (5375)	0.66 (69)	0.57 (91)
<a href="#">aimswebPlus</a>	5	22-23	0.55 (1914)	0.68 (2305)	0.66 (2184)	0.63 (1584)	0.64 (395)	0.50 (276)
<a href="#">Star Reading</a>	4	23-24	0.64 (151)	0.59 (1877)	0.62 (2126)	0.75 (50)	0.57 (47)	0.74 (42)
<a href="#">i-Ready Diagnostic</a>	3	23-24	0.56 (366)	0.60 (1734)	0.68 (1769)	0.70 (1731)	0.69 (935)	0.75 (921)
<a href="#">Star Early Literacy</a>	2	23-24	0.43 (1307)	0.53 (159)	-	-	-	-
<a href="#">Acadience Reading</a>	1	18-19	0.51 (3243)	0.66 (3724)	0.64 (3859)	0.63 (3668)	-	-

Table A2.

*Correlations with Summative Language Proficiency Tests.*

Test	State	n Reports	Recent Year	Grade-Specific Correlation (Total Sample)					
				K	1	2	3	4	5
<a href="#">WIDA ACCESS</a>	VA	2	22-23	0.48 (1603)	0.51 (1616)	0.54 (1976)	0.60 (1391)	0.68 (683)	0.70 (395)



Table A3.

*Correlations with Common Summative State Accountability Tests.*

Test	States	n Reports	Recent Year	Grade-Specific Correlation (Total Sample)					
				3		4		5	
<a href="#">STAAR RLA</a>	TX	5	23-24	0.59	(9449)	0.62	(7985)	0.60	(7112)
<a href="#">EOG Reading</a>	NC	4	22-23	0.59	(6527)	0.58	(5115)	0.57	(3696)
<a href="#">SBA ELA</a>	CA, SD, WA	3	23-24	0.64	(1707)	0.58	(915)	0.67	(1024)
<a href="#">SOL Reading</a>	VA	3	22-23	0.57	(4946)	0.60	(2753)	0.61	(2742)
<a href="#">FAST ELA</a>	FL	2	23-24	0.56	(2894)	0.59	(1850)	0.57	(1399)
<a href="#">GMAS ELA</a>	GA	1	20-21	0.59	(875)	0.59	(710)	0.59	(686)
<a href="#">ISAT</a>	ID	1	17-18	0.71	(66)	0.58	(63)	0.58	(77)
<a href="#">IREAD-3</a>	IN	1	17-18	0.65	(862)	-		-	
<a href="#">MAAP ELA</a>	MS	1	20-21	0.56	(183)	0.61	(271)	-	
<a href="#">MCA ELA</a>	MN	1	23-24	0.62	(187)	0.52	(142)	-	
<a href="#">MCAS ELA</a>	MA	1	17-18	0.41	(226)	0.45	(226)	0.38	(193)
<a href="#">NYS ELA</a>	NY	1	22-23	0.63	(519)	0.67	(271)	0.63	(223)
<a href="#">OST ELA</a>	OH	1	15-16	0.60	(468)	0.45	(472)	0.51	(448)
<a href="#">TCAP ELA</a>	TN	1	16-17	0.53	(527)	0.56	(314)	0.34	(134)
<a href="#">WI Forward ELA</a>	WI	1	17-18	0.55	(952)	0.53	(829)	0.49	(809)

Table A4.

*Correlations with Historical Summative State Accountability Tests.*

Test	State	n Reports	Recent Year	Grade-Specific Correlation (Total Sample)					
				3		4		5	
<a href="#">ACT Aspire English</a>	AR	1	20-21	0.67	(1426)	0.65	(1210)	0.73	(1194)
<a href="#">AzMERIT ELA</a>	AZ	1	17-18	-		0.49	(57)	-	
<a href="#">FSA ELA</a>	FL	2	21-22	0.60	(725)	0.66	(458)	0.66	(444)
<a href="#">ISTEP+</a>	IN	1	15-16	0.67	(906)	0.60	(803)	-	
<a href="#">PEAKS ELA</a>	AK	1	17-18	0.58	(63)	-		-	

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