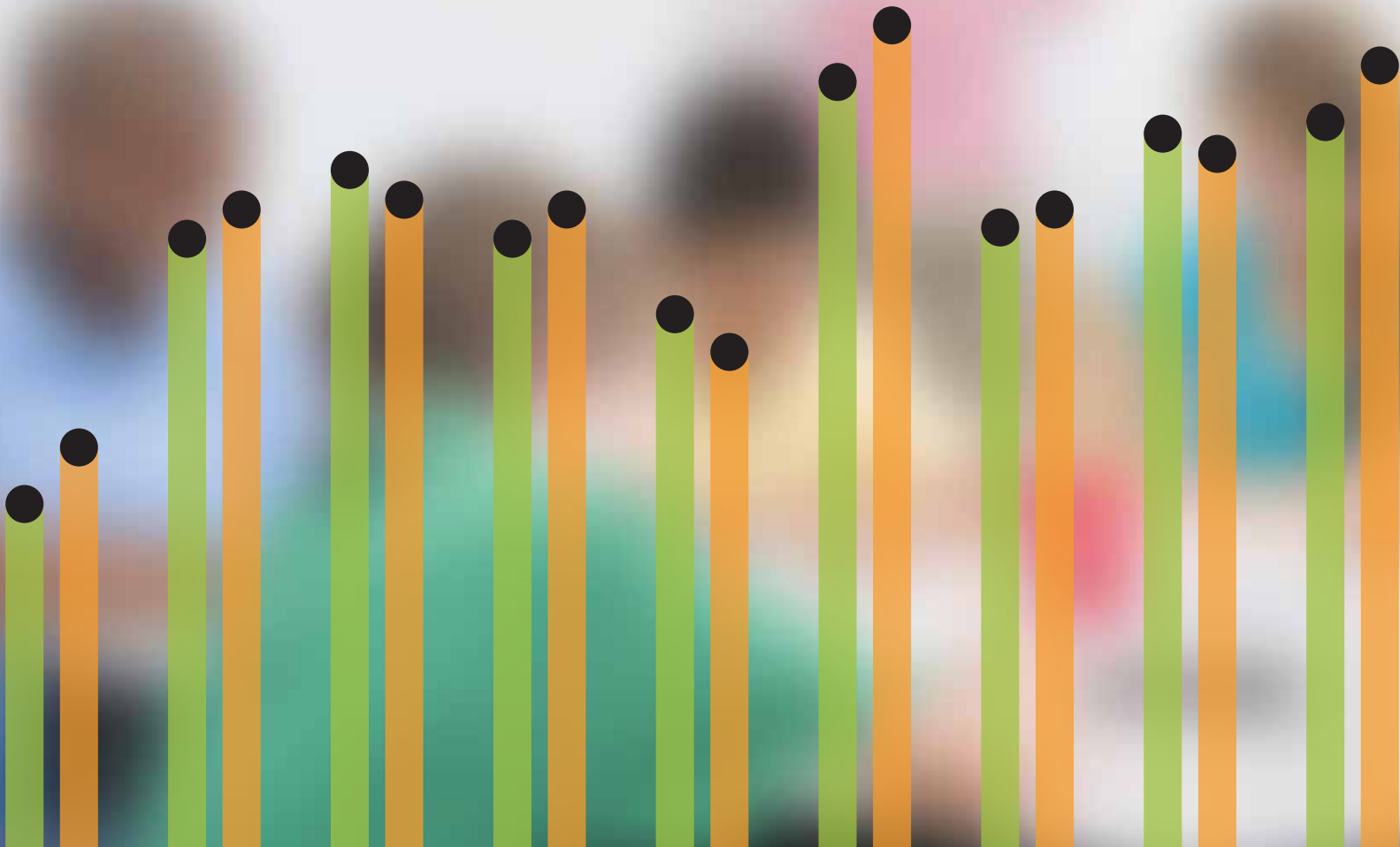




***i-Ready* and PARCC**

Findings from Independent Research Linking the
i-Ready Diagnostic and 2015 PARCC Assessments



Independent Research Finds a Strong Link between *i-Ready* and PARCC Assessments

Following the release of Partnership for Assessment of Readiness for College and Careers (PARCC) Assessment results in late 2015, the Educational Research Institute of America conducted a research study evaluating the relationship between *i-Ready Diagnostic* and the PARCC end-of-year assessments. The purpose of this study was to examine the validity evidence supporting the use of *i-Ready Diagnostic* as a tool for evaluating students' progress toward learning the knowledge and skills established in the Common Core State Standards and measured by the PARCC Assessments. Researchers analyzed the relationship between *i-Ready* scores and PARCC scores for over 13,000 students in grades 3 to 8. Students in the sample were enrolled in 41 schools across 14 districts and 5 different states (Colorado, Maryland, Mississippi, New Jersey, and Ohio).

The research found a high correlation between *i-Ready Diagnostic* and PARCC which significantly exceeded criteria set by the National Center on Response to Intervention (NCRTI). *i-Ready* was also shown to accurately classify students' PARCC proficiency status and accurately predict end-of-year proficiency rates based on students' fall, winter, and spring Diagnostic performance.

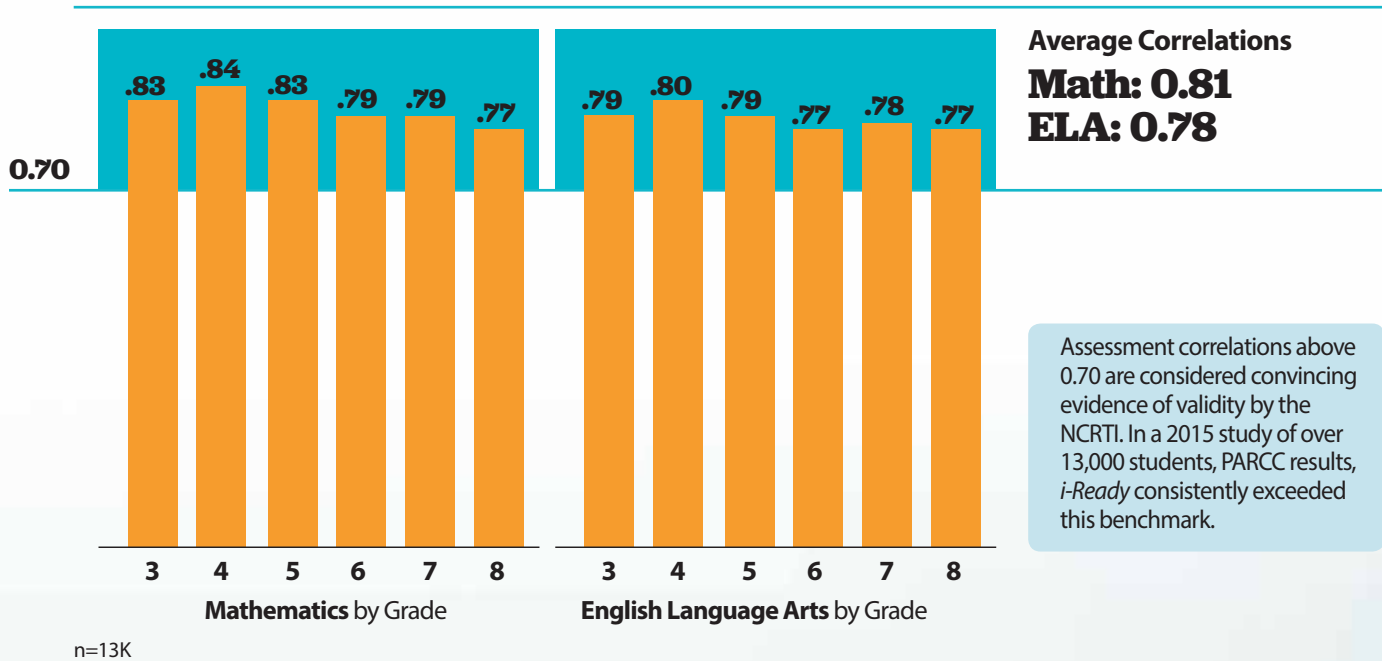
Backed by these strong results, educators can confidently use the *i-Ready Diagnostic* to guide critical decisions in their districts, schools, and classrooms. With the information available in this research and the rich data available in the *i-Ready* program, educators can:

- Identify students at risk of falling behind and make early intervention decisions to support those students.
- Predict the proportion of students who will be proficient at the school, grade, and class level to guide intervention plans and inform resource allocation decisions.
- Plan future educational strategies and curriculum decisions to help all students reach proficiency.

***i-Ready* Is Highly Correlated with PARCC Assessments**

The strong correlations between the spring *i-Ready Diagnostic* and the 2015 PARCC Assessments—with average correlations of 0.78 for English Language Arts and 0.81 for Mathematics—far surpass the 0.70 standard set by the National Center on Response to Intervention (NCRTI) for screening tools.

Correlations for Spring *i-Ready Diagnostic* and 2015 PARCC Assessments



Why Correlations Matter

Correlations are one of the most commonly used and widely accepted forms of validity evidence. Correlations demonstrate that when students score high on one assessment, they also tend to score high on the other, and, similarly, when students score low on one assessment they also tend to score low on the other. A high correlation between two assessments provides evidence that the two tests are measuring similar constructs.

***i-Ready* Accurately Predicts PARCC Proficiency Rates**

Understanding whether or not students are tracking toward proficiency is critical for educators as they plan their educational strategies, allocate scarce resources, and target intervention efforts. In an extensive analysis of *i-Ready Diagnostic* and spring 2015 PARCC scores, *i-Ready Diagnostic* results were shown to accurately predict students' PARCC Assessment results across grades and subjects.

Area Under the Curve (AUC) Analysis

The NCRTI states that when the Area Under the Curve (AUC) from ROC analysis is at least 0.85, one assessment is an accurate predictor of another assessment.* Results from the AUC analysis of spring *i-Ready Diagnostic* and PARCC scores are 0.87 or higher for all grades and subjects, surpassing the standard set by NCRTI.

AUC Values using Spring *i-Ready Diagnostic* Scores to Predict Proficiency on PARCC Assessments

Subject	Grade Level					
	3	4	5	6	7	8
Mathematics	0.92	0.91	0.91	0.89	0.90	0.89
Reading	0.89	0.90	0.89	0.89	0.88	0.87

* For additional information on ROC analysis and AUC, see the NCRTI website: <http://www.rti4success.org/screening-glossary-terms>

i-Ready's Proficiency Prediction Model Demonstrates Remarkable Accuracy

Aggregate Proficiency Prediction

Based on data collected from districts using *i-Ready Diagnostic* and taking spring 2015 PARCC Assessments, Curriculum Associates partnered with leading academics to develop a regression-based model for predicting PARCC proficiency rates. This model is designed to aid educators in predicting students' PARCC results as early in the academic year as possible, with the ultimate goal of helping guide resource allocation and intervention decisions. The prediction model proved to be remarkably accurate across grades and subjects.

The *i-Ready* model accurately predicted the observed (or actual) PARCC proficiency rates for the sample using Diagnostic data collected during the fall and winter.

i-Ready Diagnostic Accuracy in Predicting PARCC Mathematics Proficiency

Grade	Fall <i>i-Ready</i> Predicted	Winter <i>i-Ready</i> Predicted	Spring <i>i-Ready</i> Predicted	Observed PARCC	Sample Size
3	47%	47%	47%	47%	2,486
4	38%	38%	38%	38%	2,524
5	35%	35%	35%	36%	2,511
6	36%	35%	36%	36%	1,559
7	35%	36%	37%	37%	1,225
8	39%	36%	42%	38%	880

i-Ready Diagnostic Accuracy in Predicting PARCC ELA/Literacy Proficiency

Grade	Fall <i>i-Ready</i> Predicted	Winter <i>i-Ready</i> Predicted	Spring <i>i-Ready</i> Predicted	Observed PARCC	Sample Size
3	44%	44%	44%	44%	2,050
4	37%	37%	37%	37%	2,485
5	37%	37%	37%	37%	2,517
6	41%	40%	38%	38%	1,539
7	43%	45%	41%	42%	1,053
8	47%	46%	46%	45%	952

i-Ready's predicted proficiency rates were remarkably consistent with observed PARCC proficiency rates—often within 1% of observed proficiency for the sample.

Note: In the results above, the *i-Ready* Predicted percentage is the percentage of students estimated to be proficient for each grade, using the logistic regression model. The Observed PARCC percentage is the actual observed proficiency rate for the same group of students.

***i-Ready* Accurately Classifies Students on PARCC Assessments**

i-Ready was additionally evaluated on its ability to accurately classify end-of-year performance for individual students. Across all students, spring scores accurately classified students as proficient or not proficient in 83% of cases in Mathematics and in 81% of cases in English Language Arts/Literacy.

Accuracy in Classifying Students' PARCC Proficiency Status (Proficient or Not Proficient)

Subject	Grade	Accurately Classified PARCC Proficiency Status	Overestimated PARCC Proficiency Status	Underestimated PARCC Proficiency Status
Mathematics	3	84%	10%	7%
	4	83%	10%	7%
	5	83%	10%	7%
	6	82%	8%	10%
	7	83%	8%	9%
	8	81%	9%	10%
	All Students	83%	9%	8%
ELA/Literacy	3	81%	10%	9%
	4	82%	10%	8%
	5	81%	9%	10%
	6	82%	9%	9%
	7	79%	11%	9%
	8	78%	11%	11%
	All Students	81%	10%	9%

Note: Percentages may not add up to 100% due to rounding.

In addition to these strong binary classification results (determining whether a student is proficient or not proficient), *i-Ready* accurately classified individual student performance within one level of the students' exact PARCC achievement level (Levels 1 through 5) in 97% of cases in Mathematics and 96% of cases in English Language Arts/Literacy.

Using *i-Ready* to Inform Decisions

Based on the analyses explored in this research, the Educational Research Institute of America concluded that:

- *i-Ready Diagnostic* scores are strongly correlated to the scores on the PARCC English Language Arts/Literacy and Mathematics Assessments administered to students in 2015.
- *i-Ready Diagnostic* scores can be used to accurately predict and classify students' proficiency on the 2015 PARCC English Language Arts/Literacy and Mathematics Assessments.

Proficiency Prediction in the *i-Ready* Program

This research further supports *i-Ready* as an ideal tool for informing critical decisions that ultimately improve district, school, and student achievement. In order to further inform educators' most critical decisions, Curriculum Associates is building new reporting functionality for the 2016–2017 academic year that will provide a prediction of student proficiency rates (the percentage of students in a grade, school, or district predicted to reach proficiency) on PARCC Assessments based on fall and winter *i-Ready Diagnostic* results. Reports in the *i-Ready* program will allow districts to:

- Predict student proficiency rates early in the year, when changes to educational strategies and intervention efforts can have the greatest impact.
- Understand challenge areas and direct resources toward groups of students with lagging performance several months in advance of summative assessments.

About the Research

Curriculum Associates contracted with ERIA to conduct a study to evaluate the validity of *i-Ready Diagnostic* for both Reading and Mathematics. ERIA collected and analyzed *i-Ready Diagnostic* and PARCC Assessment scores for over 13,000 students during the 2014–2015 academic year. A total of 14 school districts and 41 different schools in 5 different states (Colorado, Maryland, Mississippi, New Jersey, and Ohio) were included in the study. All of the students included in the study were enrolled in grades 3 through 8.

The PARCC Assessments included in the research were administered between March and May across most participating schools. The corresponding *i-Ready Diagnostics* were administered during the 2014–2015 school year in the fall (prior to December), winter (December to mid-March), and spring (mid-March to end of May).

The research sample included a diverse range of students enrolled in grades 3 through 8 at 40 elementary and middle schools. The percentage of non-Caucasian students enrolled in the schools ranged from 9% to 73%, with an average of 38%. The percentage of students eligible for the National School Lunch Program (NSLP) ranged from 2% to 89%, with an average of 47%. The percentage of English Language Learners ranged from 1% to 13%, with an average of 3%.

ERIA conducted data analyses using overall scale scores from *i-Ready Diagnostic* and the scale scores from the 2015 PARCC Assessment. In addition to scale scores, ELA/Literacy and Mathematics achievement levels produced by the PARCC were used to determine classification accuracy; PARCC results place students at one of five levels of achievement, with an attainment of Level 4 considered “Proficient.”

The following statistical analyses were conducted:

- Correlations between the *i-Ready Diagnostics* and the PARCC ELA/Literacy and PARCC Mathematics Assessments were computed for the overall sample, as well as for each grade.
- Area Under the Curve (AUC) Receiver Operator (ROC) curve analysis was conducted to provide an overall indication of the diagnostic accuracy of the *i-Ready Diagnostics*.
- Equipercentile linking was conducted between scores on the PARCC ELA/Literacy and Mathematics Assessments and the *i-Ready* Reading and Mathematics assessments, resulting in concorded scores between the two sets of assessments.
- Classification analyses were conducted for each subject and grade level, using the *i-Ready* cut scores that were comparable to the PARCC achievement levels that resulted from the equipercentile linking of the *i-Ready* and PARCC assessments.

For the correlation analyses, the .05 level of significance was used as the level at which results would be considered statistically significant. All tests were statistically significant, with actual results significant at the ≤ 0.0001 level.

Read the Full Report

To receive a full copy of the research conducted by ERIA, please contact your Curriculum Associates representative or request a copy at info@cainc.com.

Additional Validity Research Supporting the *i-Ready Diagnostic*

The *i-Ready Diagnostic* is backed by extensive validity research and consistently achieves industry-leading results when studied alongside rigorous assessments designed to assess college and career readiness standards. Examples of additional *i-Ready* validity research include:

- 2015 *i-Ready Diagnostic* PARCC Validity Study (full report)
- 2015 *i-Ready Diagnostic* SBAC Validity Study
- 2013, 2014, and 2015 *i-Ready Diagnostic* New York State Validity Studies
- 2013 linking studies with MetaMetrics Lexile® and Quantile® measures

While this summary focuses on results from the 2015 PARCC Validity Study, other validity research is available upon request. For copies of any of these studies, please contact your account team or learn more at www.curriculumassociates.com/products/research.aspx.

About *i-Ready* Assessments

At Curriculum Associates, it's our philosophy that all assessment programs should ultimately serve students and teachers. Our goal is to provide educators with rich, intuitive assessment data that equips teachers to adapt teaching and learning and ultimately makes classrooms more efficient. With this goal in mind, we have developed the *i-Ready* system of assessments.

The *i-Ready* System of Assessments

i-Ready offers one assessment system that efficiently meets many needs. Within that system are two kinds of assessment tools: a Diagnostic that provides a global view of K–12 skills, and a grade-specific Standards Mastery measure that maps to a district's scope and sequence. This two-pronged approach provides districts with both a grade-agnostic view into to whether students are on track to reach proficiency and meet annual growth goals, and a grade-level view of students' mastery of specific skills and standards

i-Ready Diagnostic was developed in cooperation with leading academics and was built with the input and guidance of hundreds of experienced educators. The *i-Ready Diagnostic* is also backed by extensive validity research and consistently achieves industry-leading results when studied alongside rigorous assessments designed to assess college and career readiness standards. Educators use the *i-Ready Diagnostic* to:

- Diagnose student needs at the sub-skill level and prescribe proven instructional resources for each student
- Identify grades, classes, and students at risk of falling behind
- Determine where additional resources are needed, and for which groups
- Organize differentiated small group instruction and identify appropriate instructional resources for each group
- Track student growth over time, ensuring all students are making progress toward long-term academic success

i-Ready Standards Mastery, a new assessment tool launched in the fall of 2015, is designed to provide deep insight into students' mastery of individual grade-level standards. Educators can use *i-Ready Standards Mastery* to:

- Monitor students' ongoing progress through grade-level instruction
- Provide teachers with real-time visibility into students' learning needs, informing reteaching and remediation
- Understand common misconceptions and errors through detailed response analysis
- Recommend specific instructional resources, drawing from *i-Ready* and *Ready*'s proven programs

To learn more about the *i-Ready* system of assessments, please contact your account team or request information at info@cainc.com.

***i-Ready* Advisors**

i-Ready Diagnostic was developed in cooperation with leading academics and was built with the input and guidance of hundreds of experienced educators. In addition to this input, *i-Ready* Assessments are developed and continuously improved based on the guidance of an expert team of technical advisors.

The *i-Ready* Technical Advisory Committee Members and Expert Curriculum Advisors include:

Dr. Laine Bradshaw, Assistant Professor of Quantitative Methodology in the Educational Psychology Department at the University of Georgia

- Psychometrician whose research focuses on advancing diagnostic measurement methodology for providing multidimensional information about students' complex knowledge structures, including concepts they understand as well as misconceptions they have.
- Recipient of the Jason Millman Promising Measurement Scholar Award from the National Council on Measurement in Education.

Dr. Richard Brown, Founder and CEO of West Coast Analytics

- Former Associate Professor, Psychometrician, Rossier School of Education of the University of Southern California.
- Former Director of National Center for Research on Evaluation, Standards, and Student Testing (CRESST) at UCLA.
- One of the primary psychometricians for *i-Ready Diagnostic* since its inception.

Dr. David Chard, Dean of the Annette Caldwell Simmons School of Education and Human Development at Southern Methodist University

- Research review panelist at both state and national levels, including panels of the National Science Foundation and U.S. Department of Education.
- Awarded more than \$11 million in federal, state, and private grants since 1993.

Dr. Hua Hua Chang, Professor of Psychology at the University of Illinois at Urbana-Champaign

- Editor-in-Chief of *Applied Psychological Measurement*, past President of the Psychometric Society (2012–2013), and a Fellow of the American Educational Research Association.
- Currently serves as the director of the Confucius Institute at UIUC, and he was most recently awarded the Changjiang Scholar Chair Professorship by the Ministry of Education of the People's Republic of China.

Dr. James W. Cunningham, Professor Emeritus of Literacy Studies, University of North Carolina at Chapel Hill

- Widely known for his research on text complexity and reading comprehension. Work has been featured in many prominent publications, including the *Journal of Literacy Research* and *Reading Research Quarterly*.
- Elected member of the ILA Reading Hall of Fame.

Dr. Mark Ellis, Professor of Education at California State University, Fullerton and Director of the Mathematics and Science Teacher Initiative

- Principal Investigator or co-Principal Investigator for four projects involving innovative approaches to teacher preparation and teacher development.
- Served on the National Council of Teachers of Mathematics (NCTM) Board of Directors from 2011–2014 and contributed to the development of NCTM's *Principles to Actions: Ensuring Mathematical Success for All*.
- Has published over 40 articles and in 2015 received NCTM's Linking Research to Practice Award as co-author of the *Mathematics Teaching in the Middle School* article, "Multidimensional Mathematics Teaching."

Dr. Lori Helman, Associate Professor in the Department of Curriculum and Instruction at the University of Minnesota

- Many years of bilingual teaching experience at the early grades; leads new teacher induction programs.
- Co-Director of the Minnesota Center for Reading Research.

Dr. Andrew Ho, Professor of Education at the Harvard Graduate School of Education

- Dr. Ho's research critiques and clarifies educational accountability metrics, including proficiency, growth, achievement gaps, and value-added.
- Member of the National Assessment Governing Board and a recipient of the Jason Millman Promising Measurement Scholar Award from the National Council on Measurement in Education.

Dr. Stephen Sireci, Professor of Education and Co-Chairperson of the Research and Evaluation Methods Program and Director of the Center for Educational Assessment in the School of Education at the University of Massachusetts Amherst

- His research focuses primarily on educational test development and evaluation, particularly issues of validity, cross-lingual assessment, standard setting, and computer-based testing.

