



Istation

Linking California Smarter Balanced to ISIP™ Reading

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Executive Summary

This study provides the proficiency projection of Istation's Indicators of Progress (ISIP™) Reading on the Smarter Balanced reading assessments for grades three through six. Classification accuracy is also provided. All data came from students in one school district in California. There were 337 third grade, 385 fourth grade, 336 fifth grade, and 200 sixth grade students — a total of 1,258 students in this study.

The Pearson product-moment correlations of ISIP middle-of-the-year (MOY) and Smarter Balanced scores range from 0.60 to 0.75, and they range from 0.56 to 0.74 for ISIP end-of-the-year (EOY) and Smarter Balanced scores. They indicate strong relationships between ISIP Reading and the Smarter Balanced assessments.

The linking study between Smarter Balanced and ISIP Reading is conducted using multinomial logistic regression. At the MOY, students need to score near the 45th to the 55th percentile on ISIP to have a high probability of achieving performance level 3 (*Met Standard*) or higher on the Smarter Balanced assessments. At EOY, students need to score close to the 55th – 60th percentile range on ISIP to achieve level 3 or higher.

Classification accuracy analyses are conducted. At the MOY, the percentage of students correctly classified on the ISIP Reading with respect to Smarter Balanced was approximately 80% across grades: 82% of students who performed below the cut point on ISIP Reading did not meet level 3 or above on Smarter Balanced, And 80% of students who performed above the cut point on ISIP Reading reached level 3 or above on Smarter Balanced. ISIP Reading accurately predicted meeting ELA proficiency on Smarter Balanced about 80% of the time at the MOY.

At the EOY, the percentage of students correctly classified on the ISIP Reading with respect to Smarter Balanced was approximately 82% across grades: 78% of students who performed below the cut point on ISIP Reading did not meet level 3 or above on Smarter Balanced, and 85% of students who performed above the cut point on ISIP Reading met level 3 or above on Smarter Balanced. ISIP Reading accurately predicted meeting ELA proficiency on Smarter Balanced about 85% of the time at the EOY.

Introduction

This study provides the proficiency projection of Istation's Indicators of Progress (ISIP) Reading observed scores on the Smarter Balanced Assessment Consortium (SBAC) English Language Arts (ELA) assessment scores for third through sixth grades. Students took these two assessments during the same school year, and a correlational study and classification accuracy were also conducted.

Because students take ISIP assessments monthly or three times per year under benchmarking assessment months and take Smarter Balanced in the spring, it is helpful to conduct a linking study between the ISIP Reading and SBAC ELA assessments. Teachers and school administrators can use this information to prepare students for the SBAC ELA in the spring.

The ISIP Reading assessments have strong correlations with other state assessments, and linking studies with other assessments demonstrated that ISIP can be used to project student proficiency on end-of-year assessments such as the State of Texas Assessment of Academic Readiness (STAAR) (Wolf & Locke, 2022), Virginia Standards of Learning (Campbell, Sutter, & Lambie, 2019), Ohio AIR (LePlante, 2019), Renaissance STAR (Campbell, Sutter, Lambie, & Tinstman Jones, 2019), CMAS ELA (Patarapichayatham, 2019), Idaho SAT (Wolfe & Ross, 2020), New Jersey Student Learning Standards (NJSLA) (Wolf & Locke, 2022), and PARCC (Cook & Ross, 2020). All information can be found on our website (www.istation.com).

Methodology

ISIP Reading Assessments

ISIP Reading assessments are computer-adaptive tests (CAT) using the two-parameter Item Response Theory, and they measure critical domains such as reading comprehension, fluency, vocabulary, and spelling. The assessments can be used for progress monitoring within or across academic years. ISIP is frequently administered to an entire classroom, school, or district in a single day. Student results are immediately available online for teachers and administrators, illustrating each student's past and present performance and skill growth. Teachers receive alerts when students are not making adequate progress so that they can modify instruction before a pattern of failure

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has set in (Mathes, 2011). ISIP Reading helps teachers identify deficits and provide differentiated instruction according to a student's pattern of strengths and weaknesses.

ISIP Reading is available for prekindergarten through 8th grade students and has a continuous vertical scale that assesses reading ability across these grades. In addition to detailed reports, Istation provides teachers and other school personnel with links to teaching resources and targeted intervention strategies (Mathes et al., 2016). Scaled scores range between 100 and 900. There are five performance levels for ISIP Reading.

- Level 1: at or below the 20th percentile rank
- Level 2: between the 21st and 40th percentile rank
- Level 3: between the 41st and 60th percentile rank
- Level 4: between the 61st and 80th percentile rank
- Level 5: at or above the 81st percentile rank

Smarter Balanced ELA Assessments

The Smarter Balanced assessment system utilizes computer-adaptive tests (CAT) and performance tasks, allowing students to show what they know and can do. It is based on the Common Core State Standards for English language arts/literacy (ELA) and mathematics and has three components designed to support teaching and learning throughout the year: summative assessments, interim assessments, and Tools for Teachers formative assessment resources (<https://www.cde.ca.gov/ta/tg/sa/>).

Smarter Balanced uses a vertical scale that assumes student proficiency is increased across different grade levels and reports scaled scores ranging between 2,000 and 3,000. After students take the Smarter Balanced assessments, their results are reported in two primary ways: scaled scores and achievement levels. Table 1 shows cut scores and achievement levels. The Level 3 cut score demarks the minimum level of performance considered “proficient” for Smarter Balanced ELA. There are four performance levels for Smarter Balanced ELA.

- Level 1: *Did Not Meet Standard* indicates students have not met the achievement standards for that grade.
- Level 2: *Nearly Met Standard* indicates students have nearly met the achievement standards.
- Level 3: *Met Standard* indicates students have met the achievement standards.

- Level 4: *Exceeded Standard* indicates students have exceeded the achievement standards for that grade.

Table 1: *Smarter Balanced ELA Cut Scores*

Grade	Level 1 Did Not Meet	Level 2 Nearly Met	Level 3 Met	Level 4 Exceeded
3	2114–2366	2367–2431	2432–2489	2490–2623
4	2131–2415	2416–2472	2473–2532	2533–2663
5	2201–2441	2442–2501	2502–2581	2582–2701
6	2210–2456	2457–2530	2531–2617	2618–2724

Analytic Sample

The analytic sample for this study consisted of third through sixth grade students in one school district in California in the 2018–2019 school year. Students took ISIP Reading in the beginning-of-the-year (BOY), middle-of-the-year (MOY), and end-of-the-year (EOY) assessment months and Smarter Balanced ELA in the spring.

There were 337 third grade, 385 fourth grade, 336 fifth grade, and 200 sixth grade students. In third grade, 50% were male, 50% female, and approximately 80% of students were Hispanic. In fourth grade, 48% were male, 52% female, and approximately 82% of students were Hispanic. In fifth grade, 51% were male, 49% female, and approximately 90% of students were Hispanic. In sixth grade, 53% were male, 47% female, and approximately 85% of students were Hispanic.

Istation released new ISIP Reading scale scores in 2022 with norms based on the 2018–2019 school year. We converted the scale scores into the revised vertical scale and computed means for ISIP and the Smarter Balanced ELA. These are available in Table 2. The within-year growth was flat from the MOY to the EOY in the third and sixth grades, and students in the fourth and fifth grades had positive growth trajectories from the BOY to the EOY.

Table 2. *ISIP Reading and Smarter Balanced ELA Mean Scores and Standard Deviation (SD)*

Grade	ISIP BOY Score (SD)	ISIP MOY Score (SD)	ISIP EOY Score (SD)	Smarter Balanced Score (SD)
3	418.78 (62.70)	425.84 (67.60)	425.13 (67.09)	2,398.28 (90.10)
4	458.73 (55.03)	467.95 (63.34)	482.90 (69.35)	2,437.32 (89.32)
5	478.31 (59.65)	482.54 (68.75)	486.50 (67.22)	2,468.23 (84.38)
6	502.11 (57.40)	510.92 (60.18)	510.75 (62.70)	2,498.07 (90.21)

Analysis

Our analytic plan first evaluated the Pearson product-moment correlations between the ISIP and Smarter Balanced assessments. Then we used multinomial logistic regression to determine probabilities for reaching level 3 (*Met Standard*) or above on the Smarter Balanced ELA. Finally, we conducted a classification accuracy to determine cut points for ISIP scores that best predict whether students will achieve levels 3 or 4 (*Met or Exceeded Standard*) on the Smarter Balanced ELA.

Linking Study Analysis

We used multinomial logistic regression to determine the probabilities of reaching the Smarter Balanced ELA performance level 2 (*Nearly Met Standard*), level 3 (*Met Standard*), or level 4 (*Exceeded Standard*). The ISIP scores are the predictor, and the Smarter Balanced ELA performance levels are the outcome variable. Students who had ISIP scores between the 1st and 99th percentile ranks were included in the analysis. The model is fitted for each grade separately. A total of 20 ISIP Reading scaled scores in the MOY and EOY of third through sixth grades are selected, corresponding to the 1st through 99th percentile ranks with an increment of five. For the outcome variable in the

multinomial logistic regression, performance levels are defined by the Smarter Balanced proficiency cut points (see Table 1).

The probability of students achieving Smarter Balanced ELA performance level 2 (*Nearly Met*) or above is computed by adding the probabilities of levels 2, 3, and 4. The probability of achieving Smarter Balanced ELA performance level 3 or above is computed by adding the probabilities of levels 3 and 4. The probability of achieving Smarter Balanced performance level 4 is the probability of level 4 itself. The analyses are computed using R software with the *nnet* package.

Classification Accuracy Analysis

Classification accuracy is a classification model. It measures the extent to which ISIP Reading scores accurately predicted whether students in the sample would achieve level 3 or higher on the Smarter Balanced ELA.

Sample students were classified as “Predicted Not Proficient” or “Predicted Proficient” based on their Smarter Balanced scores. They were also classified as “Observed Not Proficient” or “Observed Proficient” based on their ISIP Reading scores. Table 3 shows a classification of students based on their observed ISIP Reading scores and predicted status on the Smarter Balanced ELA. Students classified in the true negative (TN) category were those predicted to be Not Proficient based on the ISIP Reading cut scores who were also classified as Observed Not Proficient based on the Smarter Balanced cut scores. Students classified in the true positive (TP) category were those predicted to be Proficient based on the ISIP Reading cut scores who were also classified as Observed Proficient based on the Smarter Balanced cut scores. Students classified in the false positive (FP) category were those predicted to be Proficient based on the ISIP Reading cut scores but who were classified as Observed Not Proficient based on the Smarter Balanced cut scores. Students classified in the false negative (FN) category were those predicted to be Not Proficient based on the ISIP Reading cut scores but who were classified as Observed Proficient based on the Smarter Balanced cut scores. The overall classification accuracy was computed as the proportion of correct classifications among the entire sample by $(TP+TN) / (TP+TN+FP+FN)$.

Table 3. *Performance Classification Based on ISIP Reading Scores and Smarter Balanced ELA (SBAC) Levels*

Observed Proficiency	Predicted Not Proficient (SBAC)	Predicted Proficient (SBAC)
Observed Not Proficient (ISIP)	True Negative	False Negative
Observed Proficient (ISIP)	False Positive	True Positive

Linking California Smarter Balanced to ISIP Reading

We conducted classification accuracy of ISIP cut scores at the 30th, 35th, 40th, 45th, 50th, 55th, 60th, 65th, 70th, 75th, and 80th percentiles and Smarter Balanced levels 3 or higher. The area under the curve (AUC), sensitivity (TN), specificity (TP), FP, FN, and the overall rate were computed and compared to determine the best ISIP Reading cut point to identify students who would most likely meet level 3 or higher on the Smarter Balanced ELA in the spring.

Results

Correlational Study

The Pearson product-moment correlations of ISIP MOY and Smarter Balanced and of ISIP EOY and Smarter Balanced are conducted and shown in Table 4. In the MOY, the correlations range from 0.60 to 0.75, indicating strong relationships between ISIP Reading and the Smarter Balanced assessments when students take ISIP Reading at MOY and Smarter Balanced in spring. At the EOY, the correlations were slightly lower than MOY. They range from 0.56 to 0.74, indicating strong relationships between ISIP Reading and the Smarter Balanced assessments when students take both ISIP Reading and Smarter Balanced in spring.

Table 4. *Pearson Product-Moment Correlations of ISIP Reading and Smarter Balanced ELA*

Grade	ISIP MOY	ISIP EOY
3	0.748	0.656
4	0.715	0.736
5	0.602	0.555
6	0.688	0.634

Linking Study: ISIP at MOY and Smarter Balanced

Tables 5 and 6 are concordance tables derived from statistical linking procedures that directly link ISIP Reading scores and Smarter Balanced assessment performance levels. Concordance tables provide helpful information for educators, parents, administrators, researchers, and policymakers to evaluate students' academic performance. Probabilities that are less than .33 are classified as a low probability of

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reaching a certain level. Medium probabilities of reaching a level are from .33 to .66 (33% to 66%), and high probability of reaching a level are those that are greater than .66. Projections are based on students achieving a high probability of reaching a level.

Students in third grade who attained an ISIP Reading score around 434 (25th percentile rank) or higher are projected to achieve Smarter Balanced performance level 2 (*Nearly Met*) or higher. Students who attained an ISIP Reading score around 481 (55th percentile rank) or higher are projected to achieve Smarter Balanced performance level 3 (*Met*) or higher. If they attained an ISIP Reading score around 512 (75th percentile ranks) or higher, they are projected to achieve Smarter Balanced performance level 4 (*Exceeded*).

Students in fourth grade who attained an ISIP Reading score around 476 (25th percentile rank) or higher are projected to achieve Smarter Balanced performance level 2 (*Nearly Met*) or higher. Students who attained an ISIP Reading score around 509 (45th percentile rank) or higher are projected to achieve Smarter Balanced performance level 3 (*Met*) or higher. If they attained an ISIP Reading score around 578 (85th percentile rank) or higher, they are projected to achieve Smarter Balanced performance level 4 (*Exceeded*).

Table 5: Third and Fourth Grades Smarter Balanced Proficiency Projection for ISIP at MOY

Grade	Overall Score	Percentile	Level 2 Probability	Level 2	Level 3 Probability	Level 3	Level 4 Probability	Level 4
3	363	5	0.292	Low	0.028	Low	0.001	Low
3	392	10	0.435	Medium	0.077	Low	0.007	Low
3	410	15	0.541	Medium	0.137	Low	0.019	Low
3	423	20	0.623	Medium	0.202	Low	0.039	Low
3	434	25	0.694	High	0.274	Low	0.067	Low
3	443	30	0.750	High	0.345	Medium	0.101	Low
3	452	35	0.802	High	0.426	Medium	0.148	Low
3	460	40	0.845	High	0.502	Medium	0.200	Low
3	467	45	0.878	High	0.571	Medium	0.254	Low
3	474	50	0.906	High	0.638	Medium	0.315	Low
3	481	55	0.930	High	0.702	High	0.380	Medium
3	489	60	0.951	High	0.767	High	0.457	Medium
3	496	65	0.965	High	0.816	High	0.524	Medium
3	504	70	0.977	High	0.863	High	0.597	Medium
3	512	75	0.985	High	0.901	High	0.663	High
3	522	80	0.992	High	0.935	High	0.735	High
3	533	85	0.996	High	0.960	High	0.800	High
3	548	90	0.998	High	0.980	High	0.866	High
3	572	95	0.999	High	0.994	High	0.930	High
3	626	99	0.999	High	0.999	High	0.985	High
4	408	5	0.207	Low	0.032	Low	0.002	Low
4	435	10	0.350	Medium	0.094	Low	0.010	Low
4	452	15	0.472	Medium	0.173	Low	0.026	Low
4	465	20	0.578	Medium	0.263	Low	0.049	Low
4	476	25	0.669	High	0.357	Medium	0.081	Low
4	485	30	0.740	High	0.443	Medium	0.116	Low
4	493	35	0.797	High	0.522	Medium	0.154	Low
4	501	40	0.846	High	0.599	Medium	0.199	Low
4	509	45	0.887	High	0.672	High	0.250	Low
4	516	50	0.916	High	0.730	High	0.297	Low
4	524	55	0.942	High	0.788	High	0.353	Medium
4	531	60	0.958	High	0.831	High	0.403	Medium
4	539	65	0.972	High	0.871	High	0.460	Medium
4	547	70	0.982	High	0.903	High	0.514	Medium
4	556	75	0.989	High	0.931	High	0.573	Medium
4	566	80	0.994	High	0.953	High	0.633	Medium
4	578	85	0.997	High	0.971	High	0.698	High
4	593	90	0.999	High	0.984	High	0.766	High
4	616	95	0.999	High	0.994	High	0.846	High
4	661	99	0.999	High	0.999	High	0.936	High

Linking California Smarter Balanced to ISIP Reading

Fifth grade students who attained an ISIP Reading score around 492 (20th percentile rank) or higher are projected to achieve Smarter Balanced performance level 2 (*Nearly Met*) or higher. Students who attained an ISIP Reading score around 547 (50th percentile rank) or higher are projected to achieve Smarter Balanced performance level 3 (*Met*) or higher. If they attained an ISIP Reading score around 629 (90th percentile rank) or higher, they are projected to achieve Smarter Balanced performance level 4 (*Exceeded*).

Students in sixth grade who attained an ISIP Reading score around 498 (15th percentile rank) or higher are projected to achieve Smarter Balanced performance level 2 (*Nearly Met*) or higher. Students who attained an ISIP Reading score around 576 (55th percentile rank) or higher are projected to achieve Smarter Balanced performance level 3 (*Met*) or higher. If they attained an ISIP Reading score around 675 (95th percentile rank) or higher, they are projected to achieve Smarter Balanced performance level 4 (*Exceeded*).

Overall, each grade has different cut points for achieving Smarter Balanced performance level 3 (*Met*) or higher. Third grade students need to be at the 55th percentile, fourth grade students need to be at the 45th percentile, and fifth grade students need to be at the 50th percentile. Sixth grade students need to be at the 55th percentile to reach the *Met* level on the Smarter Balanced.

Table 6: Fifth and Sixth Grades Smarter Balanced Proficiency Projection for ISIP at MOY

Grade	Overall Score	Percentile	Level 2 Probability	Level 2	Level 3 Probability	Level 3	Level 4 Probability	Level 4
5	432	5	0.307	Low	0.036	Low	0.001	Low
5	461	10	0.464	Medium	0.102	Low	0.006	Low
5	479	15	0.579	Medium	0.181	Low	0.016	Low
5	492	20	0.665	High	0.260	Low	0.029	Low
5	504	25	0.741	High	0.349	Medium	0.049	Low
5	513	30	0.794	High	0.423	Medium	0.070	Low
5	522	35	0.841	High	0.501	Medium	0.097	Low
5	531	40	0.880	High	0.578	Medium	0.130	Low
5	539	45	0.910	High	0.644	Medium	0.165	Low
5	547	50	0.933	High	0.705	High	0.205	Low
5	555	55	0.952	High	0.760	High	0.248	Low
5	563	60	0.966	High	0.808	High	0.295	Low
5	571	65	0.976	High	0.848	High	0.344	Medium
5	580	70	0.985	High	0.886	High	0.400	Medium
5	589	75	0.990	High	0.915	High	0.457	Medium
5	600	80	0.994	High	0.943	High	0.526	Medium
5	612	85	0.997	High	0.963	High	0.596	Medium
5	629	90	0.999	High	0.981	High	0.687	High
5	653	95	0.999	High	0.993	High	0.789	High
5	702	99	0.999	High	0.999	High	0.916	High
6	453	5	0.359	Medium	0.035	Low	0.000	Low
6	480	10	0.543	Medium	0.094	Low	0.001	Low
6	498	15	0.670	High	0.165	Low	0.004	Low
6	512	20	0.760	High	0.242	Low	0.009	Low
6	523	25	0.820	High	0.313	Low	0.015	Low
6	533	30	0.867	High	0.385	Medium	0.024	Low
6	543	35	0.904	High	0.461	Medium	0.037	Low
6	552	40	0.930	High	0.530	Medium	0.052	Low
6	560	45	0.949	High	0.591	Medium	0.070	Low
6	568	50	0.963	High	0.648	Medium	0.093	Low
6	576	55	0.974	High	0.703	High	0.120	Low
6	585	60	0.983	High	0.758	High	0.157	Low
6	593	65	0.988	High	0.802	High	0.196	Low
6	602	70	0.992	High	0.845	High	0.246	Low
6	612	75	0.996	High	0.884	High	0.308	Low
6	622	80	0.997	High	0.916	High	0.377	Medium
6	635	85	0.999	High	0.946	High	0.470	Medium
6	651	90	0.999	High	0.971	High	0.583	Medium
6	675	95	0.999	High	0.989	High	0.732	High
6	721	99	0.999	High	0.999	High	0.905	High

Linking Study: ISIP at EOY and Smarter Balanced

Table 7 shows the probability projection of third and fourth grade ISIP Reading scores at EOY to predict Smarter Balanced ELA performance levels. Similar to the projections at MOY, the proficiency projection for a level on the Smarter Balanced is based on having a high probability ($> .66$) of reaching the level based on the results from the multinomial logistic regression analysis.

Students in third grade who attained an ISIP Reading score around 448 (25th percentile rank) or higher are projected to achieve Smarter Balanced performance level 2 (*Nearly Met*) or higher. Students who attained an ISIP Reading score around 506 (60th percentile rank) or higher are projected to achieve Smarter Balanced performance level 3 (*Met*) or higher. If they attained an ISIP Reading score around 571 (90th percentile rank) or higher, they are projected to achieve Smarter Balanced performance level 4 (*Exceeded*).

Students in fourth grade who attained an ISIP Reading score around 490 (25th percentile rank) or higher are projected to achieve Smarter Balanced performance level 2 (*Nearly Met*) or higher. Students who attained an ISIP Reading score around 533 (50th percentile rank) or higher are projected to achieve Smarter Balanced performance level 3 (*Met*) or higher. If they attained an ISIP Reading score around 586 (80th percentile rank) or higher, they are projected to achieve Smarter Balanced performance level 4 (*Exceeded*).

Fifth grade students who attained an ISIP Reading score around 502 (20th percentile rank) or higher are projected to achieve Smarter Balanced performance level 2 (*Nearly Met*) or higher. Students who attained an ISIP Reading score around 567 (55th percentile rank) or higher are projected to achieve Smarter Balanced performance level 3 (*Met*) or higher. If they attained an ISIP Reading score around 643 (90th percentile rank) or higher, they are projected to achieve Smarter Balanced performance level 4 (*Exceeded*).

Students in sixth grade who attained an ISIP Reading score around 462 (5th percentile rank) or higher are projected to achieve Smarter Balanced performance level 2 (*Nearly Met*) or higher. Students who attained an ISIP Reading score around 556 (35th percentile rank) or higher are projected to achieve Smarter Balanced performance level 3 (*Met*) or higher. If they attained an ISIP Reading score around 608 (65th percentile rank) or higher, they are projected to achieve Smarter Balanced performance level 4 (*Exceeded*).

Table 7: Third and Fourth Grades Smarter Balanced Proficiency Projection for ISIP at EOY

Grade	Overall Score	Percentile	Level 2 Probability	Level 2	Level 3 Probability	Level 3	Level 4 Probability	Level 4
3	371	5	0.279	Low	0.023	Low	0.002	Low
3	402	10	0.417	Medium	0.065	Low	0.011	Low
3	422	15	0.524	Medium	0.121	Low	0.025	Low
3	436	20	0.605	Medium	0.181	Low	0.044	Low
3	448	25	0.676	High	0.249	Low	0.069	Low
3	458	30	0.733	High	0.316	Low	0.097	Low
3	467	35	0.781	High	0.383	Medium	0.129	Low
3	475	40	0.820	High	0.447	Medium	0.163	Low
3	483	45	0.856	High	0.512	Medium	0.201	Low
3	491	50	0.887	High	0.576	Medium	0.243	Low
3	499	55	0.912	High	0.639	Medium	0.287	Low
3	506	60	0.931	High	0.689	High	0.328	Low
3	514	65	0.949	High	0.742	High	0.375	Medium
3	523	70	0.964	High	0.795	High	0.428	Medium
3	532	75	0.975	High	0.839	High	0.479	Medium
3	542	80	0.984	High	0.879	High	0.533	Medium
3	555	85	0.991	High	0.918	High	0.598	Medium
3	571	90	0.996	High	0.950	High	0.668	High
3	596	95	0.999	High	0.978	High	0.757	High
3	653	99	0.999	High	0.997	High	0.886	High
4	419	5	0.185	Low	0.042	Low	0.006	Low
4	448	10	0.341	Medium	0.114	Low	0.023	Low
4	465	15	0.465	Medium	0.190	Low	0.049	Low
4	479	20	0.577	Medium	0.275	Low	0.085	Low
4	490	25	0.665	High	0.354	Medium	0.124	Low
4	500	30	0.738	High	0.433	Medium	0.169	Low
4	509	35	0.797	High	0.505	Medium	0.217	Low
4	517	40	0.842	High	0.568	Medium	0.264	Low
4	525	45	0.880	High	0.628	Medium	0.313	Low
4	533	50	0.911	High	0.684	High	0.365	Medium
4	541	55	0.935	High	0.735	High	0.418	Medium
4	549	60	0.953	High	0.780	High	0.469	Medium
4	557	65	0.967	High	0.819	High	0.520	Medium
4	565	70	0.977	High	0.852	High	0.568	Medium
4	575	75	0.985	High	0.886	High	0.624	Medium
4	586	80	0.991	High	0.916	High	0.680	High
4	598	85	0.995	High	0.940	High	0.734	High
4	614	90	0.998	High	0.962	High	0.793	High
4	638	95	0.999	High	0.982	High	0.861	High
4	685	99	0.999	High	0.996	High	0.938	High

Table 8: Fifth and Sixth Grades Smarter Balanced Proficiency Projection for ISIP at EOY

Grade	Overall Score	Percentile	Level 2 Probability	Level 2	Level 3 Probability	Level 3	Level 4 Probability	Level 4
5	440	5	0.320	Low	0.096	Low	0.003	Low
5	470	10	0.512	Medium	0.194	Low	0.012	Low
5	488	15	0.633	Medium	0.274	Low	0.024	Low
5	502	20	0.720	High	0.343	Medium	0.039	Low
5	514	25	0.786	High	0.406	Medium	0.058	Low
5	524	30	0.832	High	0.459	Medium	0.079	Low
5	533	35	0.868	High	0.507	Medium	0.102	Low
5	542	40	0.897	High	0.554	Medium	0.130	Low
5	550	45	0.919	High	0.595	Medium	0.159	Low
5	559	50	0.939	High	0.640	Medium	0.196	Low
5	567	55	0.953	High	0.678	High	0.234	Low
5	575	60	0.965	High	0.714	High	0.275	Low
5	584	65	0.975	High	0.753	High	0.325	Low
5	593	70	0.982	High	0.789	High	0.379	Medium
5	603	75	0.988	High	0.825	High	0.441	Medium
5	614	80	0.992	High	0.860	High	0.510	Medium
5	627	85	0.996	High	0.895	High	0.589	Medium
5	643	90	0.998	High	0.929	High	0.679	High
5	669	95	0.999	High	0.964	High	0.798	High
5	719	99	0.999	High	0.996	High	0.938	High
6	462	5	0.741	High	0.161	Low	0.000	Low
6	491	10	0.785	High	0.296	Low	0.000	Low
6	509	15	0.821	High	0.407	Medium	0.000	Low
6	524	20	0.852	High	0.507	Medium	0.000	Low
6	536	25	0.877	High	0.587	Medium	0.000	Low
6	547	30	0.898	High	0.658	Medium	0.002	Low
6	556	35	0.915	High	0.711	High	0.005	Low
6	565	40	0.930	High	0.762	High	0.018	Low
6	574	45	0.944	High	0.811	High	0.058	Low
6	583	50	0.960	High	0.863	High	0.170	Low
6	591	55	0.975	High	0.914	High	0.372	Medium
6	600	60	0.989	High	0.962	High	0.659	Medium
6	608	65	0.996	High	0.986	High	0.847	High
6	617	70	0.999	High	0.996	High	0.947	High
6	627	75	0.999	High	0.999	High	0.985	High
6	638	80	0.999	High	0.999	High	0.996	High
6	651	85	0.999	High	0.999	High	0.999	High
6	667	90	0.999	High	0.999	High	0.999	High
6	692	95	0.999	High	0.999	High	0.999	High
6	739	99	0.999	High	0.999	High	0.999	High

Each grade has different cut points for achieving Smarter Balanced performance level 3 (*Met*) or higher. At MOY, third grade students need to be at the 55th percentile to have a high probability of attaining level 3, fourth grade students at the 45th percentile, and fifth grade students at the 50th percentile. Sixth grade students need to be at the 35th percentile to reach level 3 (*Met*) on the Smarter Balanced. Results are similar at EOY, where third grade students need to be at the 60th percentile to have a high probability of attaining level 3, fourth graders need to be at the 50th, fifth graders need to be at the 55th percentile, and sixth graders need to be at the 35th percentile.

Classification Accuracy

Classification accuracy is conducted to predict whether students in the sample would achieve level 3 or higher on the Smarter Balanced. A higher classification accuracy rate indicates stronger congruence between ISIP Reading and Smarter Balanced assessments. We conducted a classification accuracy for third through sixth grade ISIP Reading at MOY, ISIP Reading at EOY, and Smarter Balanced level 3 (*Met*) and higher. Classification accuracy analyses are performed to determine ISIP cut points that could help differentiate students who would or would not attain level 3 (*Met*) or level 4 (*Exceeded*) on the Smarter Balanced.

Across the grades, 35% to 37% of the sample scored in the *Met* or *Exceeded* categories combined. The range for *Nearly Met* was 22% to 31%. A full description is available in Table 9.

Table 9: Percentages of the Sample Scoring in the Smarter Balanced Levels by Grade

Grade	Not Met	Nearly Met	Met	Exceeded	Met + Exceeded
3	38%	26%	18%	18%	36%
4	41%	22%	22%	15%	37%
5	37%	28%	24%	11%	35%
6	32%	31%	28%	9%	37%

We conducted classification accuracy of ISIP cut scores at the 30th, 35th, 40th, 45th, 50th, 55th, 60th, 65th, 70th, 75th, and 80th percentiles and Smarter Balanced Levels 3 or higher. The area under the curve (AUC), sensitivity (students who did not meet level 3 or above), specificity (students who *Met* level 3 or above), positive predictive power, negative predictive power, and the overall rate were computed and compared to determine the best ISIP Reading cut point to identify students who would

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most likely meet level 3 or above on the Smarter Balanced in the spring. Results show that the 40th percentile provided the best cut scores on ISIP at both MOY and EOY.

Table 10 shows results at the MOY; the AUC ranged from 0.76 to 0.85, indicating that the percentage of students correctly classified on ISIP Reading with respect to Smarter Balanced was approximately 80% across grades. Sensitivity ranged from 0.78 to 0.85, indicating that approximately 82% of students who performed below the cut point on ISIP Reading did not meet level 3 or above on Smarter Balanced. The specificity ranged from 0.74 to 0.87 indicating that approximately 80% of students who performed above the cut point on ISIP were likely to meet level 3 or above on the Smarter Balanced. ISIP Reading accurately predicted meeting ELA proficiency on Smarter Balanced about 80% of the time at the MOY.

Table 10: *Classification Accuracy Indices at the 40th Percentile at MOY*

Grade	AUC	Sensitivity	Specificity
3	0.83	0.85	0.80
4	0.85	0.83	0.87
5	0.76	0.78	0.74
6	0.80	0.82	0.77

Table 11 shows results at the EOY; the AUC ranged from 0.78 to 0.85, indicating that the percentage of students correctly classified on ISIP Reading with respect to Smarter Balanced was approximately 82% across grades. Sensitivity ranged from 0.67 to 0.88, indicating that approximately 78% of students who performed below the cut point on ISIP did not meet level 3 or above on Smarter Balanced. The specificity ranged from 0.76 to 0.98, indicating that approximately 85% of students who performed above the cut point on ISIP Reading were likely to meet level 3 or above on Smarter Balanced. ISIP Reading accurately predicted meeting ELA proficiency on Smarter Balanced about 85% of the time at the EOY.

Table 11: *Classification Accuracy Indices at the 40th Percentile at EOY*

Grade	AUC	Sensitivity	Specificity
3	0.85	0.88	0.76
4	0.82	0.79	0.85
5	0.78	0.75	0.81
6	0.83	0.67	0.98

Conclusion and Limitations

This study demonstrates how ISIP Reading scores predict students' performance on the Smarter Balanced ELA assessment. It provides helpful information to teachers and administrators to prepare their third through sixth grade students for the Smarter Balanced ELA assessments in the spring.

The Smarter Balanced performance level 3 (*Met*) identifies whether a student has met proficiency on the assessment or not. Results show that a student who obtained an ISIP Reading score around the 40th percentile rank is projected to achieve *Met* or *Exceeded* on Smarter Balanced. This result implies that if a student is in ISIP performance level 3 or above at the MOY (similar to tier 1), he or she is projected to achieve level 3 or above on the Smarter Balanced ELA for third through sixth grades. Classification accuracy with a cut point at the 40th percentile for ISIP Reading shows strong specificity and sensitivity. ISIP Reading accurately predicted meeting ELA proficiency on Smarter Balanced about 80% of the time at the MOY.

At the EOY, results are somewhat different. Students in third grade who scored at the 60th percentile had a high probability of attaining level 3, whereas students in fourth grade needed to score at the 50th percentile. Classification accuracy with a cut point at the 40th percentile for ISIP Reading shows strong specificity and sensitivity. ISIP Reading accurately predicted meeting ELA proficiency on Smarter Balanced about 85% of the time at the EOY.

The results confirm a positive relationship between the ISIP and Smart Balanced assessments. While results are promising, it must be understood that the complete certainty of passing the Smart Balanced ELA assessment is unknown as other factors besides students' reading abilities measured by the ISIP assessments may affect their Smart Balanced ELA scores.

References

- Campbell, L.O., Sutter, C. C., & Lambie, G. W. (2019). Predictability of Istation's Indicators of Progress scores on students' Virginia Standard of Learning scores: Grades 3 through 8. University of Central Florida. www.istation.com
- Campbell, L.O., Sutter, C. C., Lambie G. W., & Tinstman Jones, J. (2019). Measuring the predictability of Istation's Indicators of Progress Early Reading (ISIP ER) scores on Renaissance STAR Reading® scores. University of Central Florida. www.istation.com
- Cook, M., & Ross, S. (2020). PARCC predictability study – 3rd grade. Johns Hopkins University. www.istation.com/studies
- LePlante, J. (2019). Predictability study of Istation ISIP (Math and Reading) and Ohio AIR (Math and English Language Arts) tests for 3rd–8th grade students in the Youngstown City School District. Youngstown City Schools. www.istation.com/studies
- Mathes, P. (2011). Technical manual: Istation's Indicators of Progress, Advanced Reading: computer adaptive testing system for continuous progress monitoring of reading growth for students grade 4 through grade 8. Dallas, TX: Istation.
- Mathes, P., Torgesen, J., & Herron, J. (2016). Technical manual: Istation's Indicators of Progress, Early Reading: computer adaptive testing system for continuous progress monitoring of reading growth for students pre-K to grade 3. Dallas, TX: Istation.
- Patarapichayatham, C. (2019). Linking the Colorado Measures of Academic Success English Language Arts (CMAS ELA) assessments to ISIP Reading assessments grades 3 through 5. Southern Methodist University. www.istation.com/studies
- Wolfe, E. & Ross, S. (2020). Linking Istation ISIP Early Reading with the Idaho ISAT. Johns Hopkins University. www.istation.com/studies
- Wolf, R. & Locke, V. (2022). Linking STAAR to ISIP Reading. www.istation.com/studies
- Wolf, R. & Locke, V. (2022). Linking NJSLA to ISIP Reading. www.istation.com/studies