RESEARCH REPORT

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The Impact of IXL on ELA Learning in Connecticut

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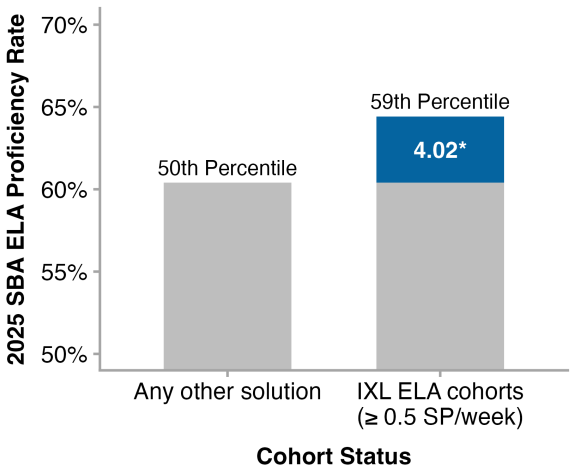
Executive Summary

IXL is an end-to-end teaching and learning solution that engages learners in Pre-K through 12th grade with a comprehensive curriculum, next-generation assessment suite, and personalized recommendations for meeting learning goals. Previous research, including a randomized controlled trial (Copeland et al., 2023), has shown that IXL can have a significant positive impact on students' academic performance (Bashkov, 2021; Empirical Education, 2013).

The goal of the present study was to examine IXL usage among 3rd- through 8th-grade students in Connecticut and its impact on English language arts (ELA) achievement, as measured by the Smarter Balanced Assessment System (SBA). Using a pretest-posttest design, we found[1]:

- **IXL implementation improves student achievement.** Grade cohorts that used IXL performed better on the SBA in ELA than grade cohorts that used any other solution. Specifically, the proficiency rate[2] was approximately four points higher for IXL ELA cohorts, relative to comparable cohorts that used any other solution.



- **Higher IXL usage is associated with better academic performance.** Students performed significantly better on the SBA in ELA when they answered more questions, reached proficiency in more skills (SP), or spent more time on IXL ELA.

[1] *In all figures, * indicates statistical significance at the p < .05 level, ** indicates p < .01, and *** indicates p < .001.*
[2] *Proficiency rate: percentage of students in a cohort classified as "meets" or "exceeds" the achievement standard.*

The Impact of IXL on ELA Learning in Connecticut

Background

IXL is an end-to-end teaching and learning solution that engages learners in Pre-K through 12th grade with a comprehensive curriculum, next-generation assessment suite, and personalized recommendations for meeting learning goals. It covers five main subject areas: mathematics, English language arts (ELA), science, social studies, and Spanish. As of this writing, IXL is used by 30% of students in the U.S. and 18 million students worldwide. IXL is deeply rooted in learning sciences research (see Bashkov et al., 2021) and engages each student in a personalized learning experience tailored to their working level. As a result, students work through problems that are neither too easy nor too difficult, which in turn supports their self-efficacy and motivation for continued learning (An & Schonberg, 2024).

Prior research, including an independent randomized controlled trial (Copeland et al., 2023), has consistently demonstrated significant positive effects of IXL on student learning. Studies on nearly 80,000 schools across all 50 states show that students in IXL schools perform better on state assessments than comparable schools using any other solution.

Study Purpose

The goal of the present study was to examine the overall efficacy and cumulative usage effects of IXL ELA among 3rd- through 8th-grade students in Connecticut. To examine the overall efficacy of IXL ELA, we compared Smarter Balanced Assessment System (SBA) ELA proficiency rates of cohorts that used IXL to the proficiency rates of cohorts that did not use IXL ELA but likely used a combination of other products. Additionally, among students using IXL ELA, we investigated the cumulative usage effects of IXL by examining the relationship between cohorts' amount of IXL usage and their SBA ELA performance.

Study Design and Methodology

RESEARCH QUESTIONS

This study investigated the following research questions:

1. **Overall efficacy of IXL ELA.** Compared to non-IXL cohorts, did IXL cohorts perform better on the SBA in ELA, controlling for baseline performance and key demographic characteristics?
2. **Cumulative usage effects of IXL ELA.** Among IXL ELA cohorts, was greater IXL ELA usage associated with larger learning gains in ELA, controlling for baseline performance and key demographic characteristics?

DATA SOURCES

Assessment and Demographic Data

We obtained assessment and demographic data from the Connecticut State Department of Education and the National Center for Education Statistics. ELA performance at pretest (2024) and posttest (2025) was measured using the SBA. The SBA is a summative assessment program that includes end-of-grade assessments in math and ELA, and it is administered in 3rd through 8th grade; this study focuses on ELA achievement. The outcome measure for both research questions was the percentage of students within a grade-level cohort classified as "Standard Met" or "Standard Exceeded" on the Spring 2025 SBA in ELA (i.e., the cohort's proficiency rate at posttest). For more information about SBA in Connecticut, see the Connecticut Department of Education Smarter Balanced homepage.

IXL Usage Data

We obtained IXL usage data from IXL's database. When students use IXL, they complete practice problems organized within "skills," or specific topic areas within a subject. IXL uses a proprietary *SmartScore* to indicate a student's proficiency within a skill. The SmartScore ranges from 0–100 and increases as students answer questions correctly. However, it is not a percent correct score; a SmartScore of 100 is always possible. A SmartScore of 80 indicates proficiency in a skill, and a SmartScore of 100 indicates mastery. IXL recommends that students should aim to reach proficiency in at least two on-grade-level skills per week (SP/week; An et al., 2022).

RESEARCH QUESTION 1: OVERALL EFFICACY OF IXL

Study Design

The purpose of the first set of analyses was to evaluate the impact of IXL usage during the 2024-25 school year on ELA performance in Connecticut. We used a quasi-experimental pretest-posttest control group design (see Figure 1). Specifically, we evaluated the impact of IXL by comparing the performance of the treatment group (IXL cohorts) and the comparison group (non-IXL cohorts) at posttest, controlling for pretest performance and key demographic variables.

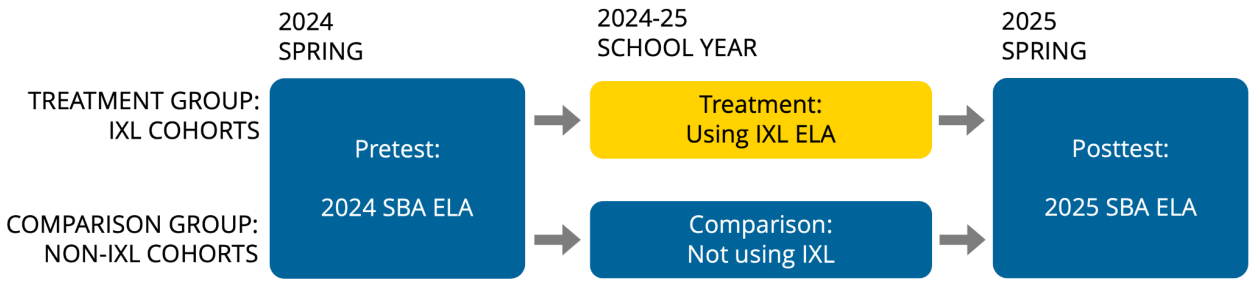


Figure 1. Study design

Participants

In this study, we included data from all grade cohorts with non-missing pretest (spring 2024), posttest (spring 2025), and demographic data. We defined the treatment group as cohorts that had reached a minimum average of 0.5 SP/week of IXL ELA practice during the study period (i.e., the 2024-25 school year). Comparison cohorts were defined as those who did not use IXL at all during the study period but likely used a combination of other products. After applying these criteria, we obtained a sample of 102 cohorts (treatment n = 51; comparison n = 51) after propensity score matching. Descriptive statistics of treatment students' IXL usage during the study period can be found in Table 1.

Table 1. Students' IXL ELA Usage During the 2024-25 School Year

	ELA (n = 51)			
Weekly IXL usage	***M***	***SD***	**Min**	**Max**
Time spent (in minutes)	13.06	6.60	4.10	39.60
Questions answered	36.32	15.11	14.98	84.72
Skills proficient	0.91	0.43	0.50	2.67

Propensity Score Matching

We conducted one-to-one propensity score matching without replacement using the *MatchIt* package in *R* (Ho et al., 2011; R Core Team, 2025) as a preprocessing step prior to analysis. A *propensity score* is the probability that a cohort would be assigned to the treatment (i.e., IXL ELA) group over the comparison group, and it is calculated using a combination of covariates. In the absence of random assignment, propensity scores can be used to match comparison cohorts to treatment cohorts and create equivalent treatment and comparison groups. In a comparison of unmatched groups, such as IXL ELA cohorts compared to all non-IXL cohorts, non-IXL cohorts could be very different from IXL cohorts on some dimensions. In contrast, using propensity score matching enables us to compare the SBA proficiency rates of pairs of IXL and non-IXL cohorts that are very similar to each other. This comparison allows for a clearer attribution of the effect of IXL and a broader generalization of the findings to other cohorts that are not yet using IXL.

Comparison cohorts were identified from 1,546 non-treatment cohorts that had complete data. Following What Works Clearinghouse (WWC) guidelines (2022), cohorts were matched on Spring 2024 SBA proficiency rate (i.e., baseline performance), grade level, percentage of male students, percentage of economically disadvantaged students, percentage of students eligible for or receiving special education services, grade size, student-teacher ratio, and location (urban, suburban, town, or rural). After matching, the resulting treatment and comparison groups had extremely similar demographic characteristics (see Appendix A).

Analysis

We specified and tested a multilevel linear regression model to account for the clustering of cohorts within schools and schools within districts. The model regressed Spring 2025 SBA proficiency rate on IXL cohort status (treatment or comparison) and the following covariates: Spring 2024 SBA proficiency rate (i.e., baseline performance), grade level, percentage of male students, percentage of economically disadvantaged students, percentage of students eligible for or receiving special education services, grade size, student-teacher ratio, and location.

Following What Works Clearinghouse (WWC) guidelines (2022), each effect is accompanied by a test of statistical significance (i.e., a *p*-value) and a measure of practical significance (i.e., effect size). The *p*-value is the probability of observing the current or more extreme data, assuming the effect is zero (Cohen, 1994). The smaller the *p*-value, the less likely it is that the result occurred at random, with *p*-values less than .05 considered statistically significant. Effect sizes are reported using Hedges' *g* and indicate the difference between "treatment" and "control" groups on an outcome measure in standard deviation units. For broad-scope educational assessments, moderate effect sizes range from about 0.05–0.20, and effect sizes of about 0.20 or higher are considered large (Kraft, 2020; Lipsey et al., 2012).

RESEARCH QUESTION 2: CUMULATIVE USAGE EFFECTS OF IXL

The goal of this set of analyses was to investigate the continuous relationship between the cumulative amount of IXL usage and SBA performance among grade cohorts that used IXL. We specifically examined cohorts' average number of questions answered per week, average number of skills proficient per week (SP/week), and average number of minutes spent practicing per week as the IXL usage metrics of interest. In these analyses, we included all grade cohorts with any amount of IXL usage during the study period. Prior to analysis, we identified cohorts that had IXL usage further than ±3 *SD*s from the mean as outliers and removed them from the sample (outlier $n = 5$, or 2.5% of the initial sample). The final sample consisted of 195 grade cohorts.

Analysis

As in the previous analysis, we specified and tested multilevel models to account for the clustering of students within schools. Because the three usage indicators were highly intercorrelated (smallest $r = .90$), we modeled each indicator separately to avoid multicollinearity. The outcome variable (proficiency rate on the Spring 2025 SBA in ELA) and covariates were the same as in the previous analysis. As there was no control or comparison group, Hedges' *g* is not applicable; however, we report standardized regression coefficients (β) to gauge the practical significance of IXL usage relative to the effects of the covariates.

Results

RESEARCH QUESTION 1: OVERALL EFFICACY OF IXL

ELA

We found a statistically significant positive effect of IXL ELA, such that cohorts that used IXL ELA outperformed non-IXL cohorts on the Spring 2025 SBA ELA test (Figure 2). Specifically, the proficiency rates of cohorts that used IXL ELA were about four points higher than the proficiency rates of comparable non-IXL cohorts ($b = 4.02$; $p = .012$; see Table B1 in Appendix B for full model results). The effect size (Hedges' *g*) was 0.22, which corresponds to a percentile gain of nine points.

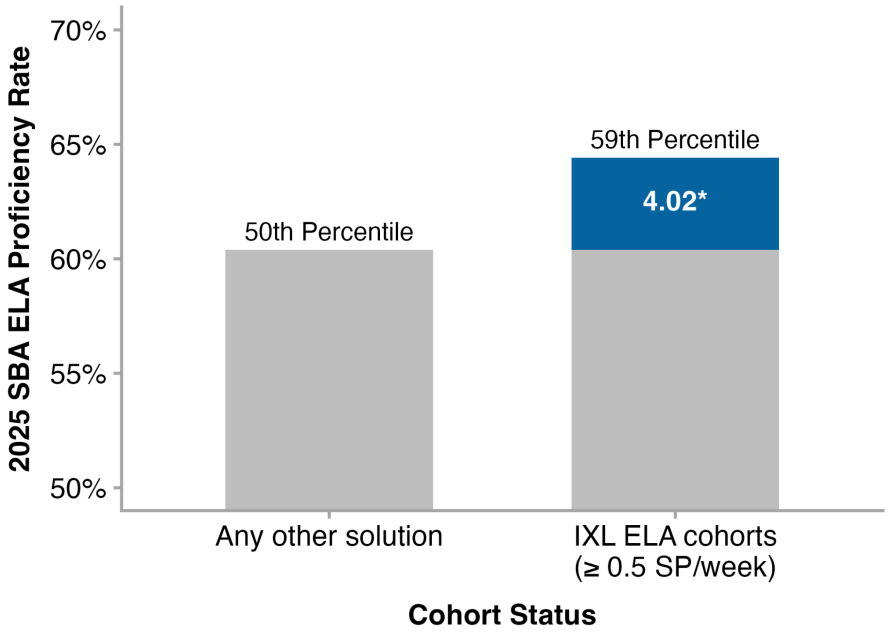


Figure 2. The efficacy of IXL ELA

RESEARCH QUESTION 2: CUMULATIVE USAGE EFFECTS OF IXL

ELA

Across all three usage metrics—questions answered, skills proficient, and time spent—IXL ELA usage was positively and statistically significantly associated with Spring 2025 SBA ELA performance, controlling for baseline performance and demographics (see Table B2 in Appendix B for full model results). Based on model coefficients and typical usage amounts, an average grade cohort's ELA proficiency rate is expected to increase by 3.24 percentage points for every additional 30 questions students answer on IXL each week ($\beta = 0.07$, $p = .017$), 5.39 percentage points for every additional skill students reach proficiency in each week ($\beta = 0.08$, $p < .001$), or 12.18 percentage points for every additional 30 minutes students spend on IXL ELA each week ($\beta = 0.09$, $p = .003$).

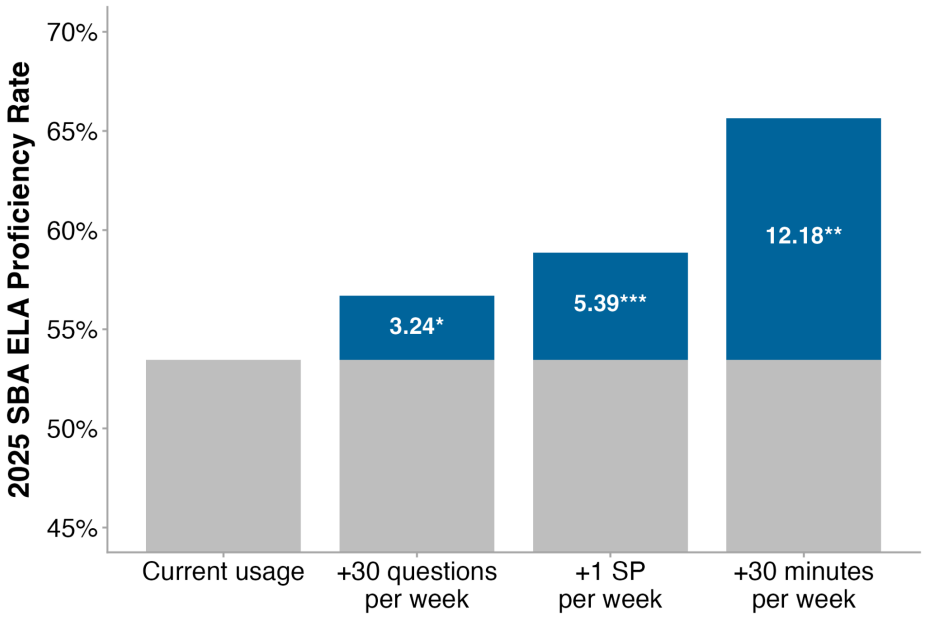


Figure 3. Predicted usage effects of IXL ELA
Note: SP = skills proficient

Discussion and Recommendations

In this study, we investigated how IXL ELA usage among 3rd- through 8th-grade students in Connecticut related to their performance on the SBA in ELA at the end of the 2024-25 school year. Controlling for baseline performance and demographics, we found that cohorts that used IXL ELA outperformed cohorts that did not use IXL. In addition, we found that greater IXL usage was associated with larger performance gains on the SBA. These results add to the large body of work showing that IXL boosts student achievement (e.g., An, 2023c, 2024; Bashkov, 2021; Cao & Schonberg, 2024; Copeland et al., 2023; Hargis, 2023; Liu, 2024; Schonberg & Hochstein, 2022; Xiong, 2022), corroborating findings that personalized learning can both help students close existing knowledge gaps and improve future learning outcomes (Kaffenberger, 2021).

In this study, students' usage of IXL was slightly lower than IXL's high-fidelity usage recommendation of reaching proficiency in two on-grade-level skills per week within each subject (An et al., 2022). Even at the lower-fidelity usage threshold of 0.5 SP/week, we still found significant positive effects of IXL usage, showing that IXL is a powerful learning tool. We anticipate that students would experience even greater gains when using IXL as recommended (i.e., 2 SP/week), as previous work has found that interventions are more effective when they are carried out with fidelity (see Finney et al., 2021; Noell et al., 2002). One way to increase implementation fidelity is through professional development

programs. Prior research shows that IXL's professional development is especially effective in driving teacher engagement and student learning (IXL Learning, 2020; An, 2023d). Another way to support students in meeting recommended weekly usage goals is to encourage persistence (Schonberg, 2023) and spaced learning sessions on IXL (Schonberg et al., 2025).

Taken together, these results show that IXL is a powerful platform that significantly boosts student learning. As an end-to-end teaching and learning solution, IXL provides a comprehensive curriculum and next-generation assessment suite that promotes students' development of key academic skills. With IXL's personalized support, students can confidently unlock their academic potential and fully prepare for every learning milestone along the way.

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Appendix A: Sample Achievement and Demographics

	Non-IXL Cohorts *n* = 51	IXL ELA Cohorts *n* = 51
Pretest and posttest		
2024 % proficient	59.17 (20.79)	56.15 (16.67)
2025 % proficient	58.86 (20.19)	60.88 (16.81)
Grade level (*n* cohorts)		
3	8	10
4	10	12
5	5	4
6	16	13
7	8	9
8	4	3
Locale (*n* cohorts)		
City	6	8
Suburb	30	30
Town	4	1
Rural	11	12
Demographics		
Gender: % male	50.91 (3.11)	51.16 (2.63)
% Special education	16.87 (4.10)	17.35 (4.27)
% Economically disadvantaged	33.36 (25.73)	36.57 (23.75)
Grade size (*n* students)	128.41 (86.50)	127.73 (78.93)
Student-teacher ratio	11.50 (1.46)	11.48 (1.91)

Note. Numbers in parentheses show standard deviations.

Appendix B: Full Regression Results

Table B1. Full Model Predicting Spring 2025 Smarter Balanced ELA Score from Use of IXL ELA at ≥ 0.5 SP per Week and Covariates

Predictor	*b*	*SE*	95% CI	β	*t*	*p*
(Intercept)	60.40	3.29	54.46 – 66.33	0.14	18.34	<.001
Spring 2024 ELA % Proficient[1]	0.63	0.09	0.47 – 0.81	0.64	7.21	<.001
Grade: 4[2]	2.30	2.31	-1.95 – 6.53	0.12	1.00	.323
Grade: 5[2]	-1.10	3.12	-6.75 – 4.58	-0.06	-0.35	.725
Grade: 6[2]	-0.32	2.39	-4.71 – 4.01	-0.02	-0.13	.895
Grade: 7[2]	1.33	2.74	-3.64 – 6.31	0.07	0.49	.628
Grade: 8[2]	0.74	3.52	-5.63 – 7.19	0.04	0.21	.833
% Economically disadvantaged[1]	-0.27	0.06	-0.38 – -0.15	-0.36	-4.29	<.001
% Male[1]	0.05	0.28	-0.46 – 0.57	0.01	0.16	.872
% Special education[1]	0.20	0.24	-0.23 – 0.63	0.05	0.85	.396
Student-teacher ratio[1]	-0.64	0.54	-1.68 – 0.34	-0.06	-1.18	.240
Grade size (*n* students)[1]	0.00	0.01	-0.02 – 0.02	0.01	0.20	.842
Locale: suburb[3]	-2.46	3.14	-8.11 – 3.19	-0.13	-0.78	.435
Locale: town[3]	-3.53	4.61	-11.90 – 4.79	-0.19	-0.77	.446
Locale: rural[3]	-7.15	3.48	-13.51 – -0.89	-0.39	-2.05	.044
Used IXL ELA	4.02	1.55	1.23 – 6.93	0.11	2.60	.012

Note. Dependent variable: Score on the Spring 2025 Smarter Balanced ELA test. b = unstandardized regression coefficient, SE = standard error, CI = confidence interval, β = standardized regression coefficient

[1] *Grand-mean centered*

[2] *Dummy coded; grade 3 as reference group*

[3] *Dummy coded; city as reference group*

Table B2. Full Model Predicting Spring 2025 Smarter Balanced ELA Score from IXL ELA Skills Proficient and Covariates

Predictor	*b*	*SE*	95% CI	β	*t*	*p*
Baseline model						
(Intercept)	51.62	2.38	47.32 – 56.78	-0.10	21.68	<.001
Spring 2024 ELA % Proficient[1]	0.55	0.07	0.43 – 0.71	0.53	8.06	<.001
Grade: 4[2]	1.51	1.72	-1.86 – 4.74	0.07	0.88	.382
Grade: 5[2]	-0.95	2.11	-5.27 – 2.88	-0.04	-0.45	.654
Grade: 6[2]	-2.28	1.92	-6.49 – 1.15	-0.11	-1.19	.237
Grade: 7[2]	-0.07	2.03	-4.61 – 3.54	0.00	-0.04	.971
Grade: 8[2]	-1.20	2.38	-6.23 – 3.07	-0.06	-0.50	.615
% Economically disadvantaged[1]	-0.25	0.05	-0.34 – -0.14	-0.32	-4.56	<.001
% Male[1]	0.01	0.23	-0.40 – 0.51	0.00	0.06	.956
% Special education[1]	-0.21	0.16	-0.51 – 0.09	-0.04	-1.29	.199
Student-teacher ratio[1]	-0.55	0.38	-1.32 – 0.13	-0.06	-1.44	.153
Grade size (*n* students)[1]	0.00	0.01	-0.02 – 0.01	-0.01	-0.41	.685
Locale: suburb[3]	3.76	2.53	-1.07 – 8.26	0.18	1.49	.142
Locale: town[3]	2.29	3.48	-4.19 – 8.58	0.11	0.66	.513
Locale: rural[3]	0.10	2.82	-5.50 – 5.12	0.00	0.03	.972
IXL usage effects						
IXL ELA questions practiced[1,4]	0.11	0.04	0.01 – 0.19	0.07	2.41	.017
IXL ELA skills proficient[1,4]	5.39	1.86	1.50 – 8.74	0.08	2.89	.004
IXL ELA time spent (min.)[1,4]	0.41	0.12	0.15 – 0.62	0.09	3.41	.001

Note. Dependent variable: Score on the Spring 2025 Smarter Balanced ELA test. b = unstandardized regression coefficient, SE = standard error, CI = confidence interval, β = standardized regression coefficient

[1] *Grand-mean centered*

[2] *Dummy coded; grade 3 as reference group*

[3] *Dummy coded; city as reference group*

[4] *Average weekly amount*