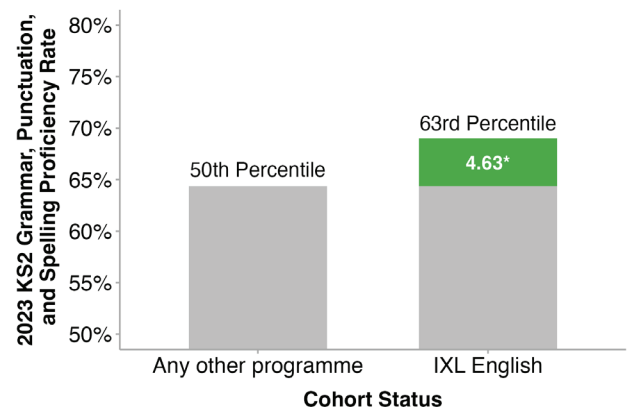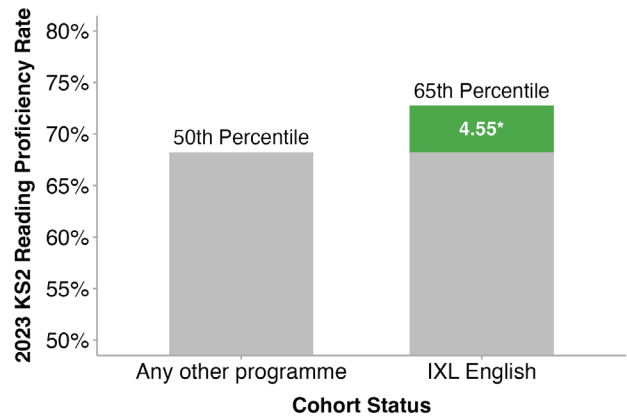IXL is an all-in-one teaching and learning platform that engages learners in Reception to Year 13 with a complete curriculum (aligned with the national curriculum) and personalised guidance for meeting learning goals. Prior research has consistently reported significant positive effects of IXL on students' learning, including in a Northamptonshire primary school (Schonberg, 2023) and in an independent randomised control trial (Copeland et al., 2023).

The goal of this study was to examine the impact of IXL usage on Key Stage 2 English Standard Assessment Test (KS2 SATs) achievement among Year 6 students across England. Key finding[1]:

- **IXL implementation improves student achievement.** Students who used IXL English performed better on the reading domain and grammar, punctuation and spelling (GPS) domain of the KS2 SAT assessment.

Study Design and Methodology

DATA SOURCES

Assessment and Demographic Data
Assessment and demographic data were obtained from the United Kingdom's Department for Education (DfE). This study analysed proficiency rates on the KS2 SATs in 2019 (pretest)[2] and 2023 (posttest). Specifically, for pretest this study used overall KS2 SAT proficiency rates from before educational disruptions brought on by the COVID-19 pandemic which affected KS2 reporting. The reading and grammar, punctuation and spelling domains of the KS2 SATs were used as outcomes[3]. More information can be found on the DfE website.

IXL Usage Data
IXL usage data were obtained from IXL's database. When students use IXL, they complete practice problems organised within "skills," or specific topic areas within a subject. IXL uses a proprietary *SmartScore* to measure a student's proficiency within a skill. On average, students in IXL cohorts reached proficiency in 1.48 skills per week (see Table 1).

Table 1. IXL English Usage During the 2022-23 School Year

Weekly IXL usage	M	SD	Min	Max
Time spent (in minutes)	16.15	19.48	0.03	158.20
Questions answered	56.15	62.18	0.17	460.09
Skills proficient	1.48	1.66	0.00	11.45

PARTICIPANTS AND DESIGN

We compared the proficiency rates of cohorts that used IXL during the 2022-23 school year to the proficiency rates of cohorts that did not use IXL during this time (but likely used a combination of other edtech products). IXL cohorts were those in

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[1] *In all figures, *indicates statistical significance at the p < .05 level.*
[2] *KS2 data broken down by year were not published between 2020-2022.*
[3] *In the current study we focus on the two English domains assessed on the national KS2 assessments: English reading and English grammar, punctuation and spelling. While English writing is also assessed at the end of KS2, scores are based on teachers' evaluations rather than on a standardised nationwide assessment and are not included in this study.*

which students, on average, met the usage criterion of 1 SP/week (skill proficient per week) during the study period (i.e., the 2022-23 school year). We used one-to-one propensity score matching to match each IXL cohort to a similar cohort that did not use IXL, creating equivalent treatment and comparison groups (for a more complete explanation of this method, see Hargis, 2024a). We obtained a sample of 170 cohorts (treatment n = 85, comparison n = 85) after propensity score matching. Demographic characteristics and baseline performance are reported in Table A1 in the Appendix.

ANALYSIS

We specified two multilevel models to account for clustering at the Local Education Authority (LEA) level. In the models, we regressed 2023 KS2 SAT proficiency rate in English reading (Analysis 1) and English grammar, punctuation and spelling (Analysis 2) on IXL English cohort status (treatment or comparison). In both analyses, we controlled for pretest performance and demographic characteristics. 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). We also report percentile gain, which is the expected change in IXL cohorts' percentile rank relative to non-IXL cohorts at the 50th percentile. Percentile gain is based on the effect size.

Results

We found that cohorts that used IXL outperformed non-IXL cohorts on the 2023 KS2 English assessments in reading and grammar, punctuation and spelling (GPS). Specifically, for IXL English cohorts, the reading proficiency rate increased by 4.55 points (p = .01; Hedges' g = 0.39). In addition, for IXL English cohorts, the GPS proficiency rate increased by 4.63 points (p = .01; Hedges' g = 0.33). This means that, relative to non-IXL cohorts, IXL English cohorts saw an additional 4% of students reach proficiency on the KS2 reading and GPS SATs. The effect sizes of 0.39 and 0.33 correspond to percentile gains of 15 and 13 points, respectively. See Tables A2 and A3 in the Appendix for detailed results.

Conclusion

In this study, we investigated the impact of IXL English on student learning in England. We found that cohorts using IXL English performed better on the KS2 English assessments in reading and grammar, punctuation and spelling than cohorts using any other programme. Specifically, our findings indicate that schools in England would see more than a 4% boost in proficiency rates on the KS2 SATs if they implemented IXL and students used it consistently. These results add to the large body of research showing that IXL is a highly effective way to support students and improve their learning (e.g., An, 2023; Bashkov, 2021; Copeland et al., 2023; Empirical Education, 2013; Hargis, 2024a, 2024b; IXL Learning, 2018, 2024; Schonberg, 2023). Based on this study and prior research, implementing IXL can help teachers increase learning growth in English and enable students to realise their full academic potential.

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Appendix

Table A1. Means (Standard Deviations) for IXL (Treatment) and Non-IXL (Comparison) Cohorts' Achievement and Demographics

	Treatment	Comparison
# of cohorts	85	85
Pretest and posttest		
2019 KS2 overall % proficiency	66.54 (13.51)	65.29 (15.01)
2023 KS2 English reading % proficiency	75.34 (12.28)	72.12 (13.62)
2023 KS2 English GPS[1] % proficiency	73.44 (13.38)	71.36 (14.50)
Demographics		
% Boys	48.31 (11.52)	50.32 (9.38)
% English language learners	25.09 (24.60)	25.02 (24.39)
% Economically disadvantaged[2]	30.21 (16.78)	30.27 (19.30)
% Special education needs	19.51 (9.01)	19.67 (10.39)
Affiliated with religion(s)	47.00%	55.29%

Note. Numbers in parentheses show standard deviations.
[1] Grammar, punctuation and spelling.
[2] As indicated by eligibility for free school meals.

Table A2. Full IXL English Efficacy Model Predicting 2023 KS2 Reading Proficiency Rate

Predictor	b	SE	95% CI		β	t	p
(Intercept)	68.22	2.42	63.45 – 72.92		-.42	28.16	< .001
2019 KS2 % proficient[1]	0.24	0.06	0.12 – 0.37		.26	3.73	< .001
% Boys[1]	0.08	0.08	-0.08 – 0.24		.06	0.94	.350
% English language learners[1]	0.00	0.04	-0.07 – 0.08		.00	0.01	.992
% Economically disadvantaged[1]	-0.20	0.06	-0.30 – -0.09		-.27	-3.53	.001
% Special education needs[1]	-0.23	0.09	-0.41 – -0.05		-.17	-2.45	.015
Religious affiliation: Church of England[2]	3.51	2.67	-1.64 – 8.74		.27	1.32	.190
Religious affiliation: Other[2]	5.06	2.38	0.46 – 9.69		.39	2.12	.036
Used IXL English	**4.55**	**1.83**	**1.04 – 8.06**		**.35**	**2.48**	**.014**

Note. Dependent variable: percentage of students reaching proficiency on the 2023 KS2 English reading assessment. *b* = unstandardised regression coefficient, *SE* = standard error, CI = confidence interval, β = standardised regression coefficient.
[1] Grand-mean centred.
[2] Dummy coded; no religious affiliation as reference group.

Table A3. Full IXL English Efficacy Model Predicting 2023 KS2 Grammar, Punctuation and Spelling Proficiency Rate

Predictor	b	SE	95% CI		β	t	p
(Intercept)	64.38	2.44	59.58 –	69.16	-.41	26.40	< .001
2019 KS2 % proficient[1]	0.25	0.06	0.13 –	0.38	.26	3.91	< .001
% Boys[1]	0.13	0.08	-0.03 –	0.29	.10	1.59	.113
% English language learners[1]	0.09	0.04	0.02 –	0.17	.16	2.32	.022
% Economically disadvantaged[1]	-0.19	0.06	-0.30 –	-0.08	-.25	-3.42	.001
% Special education[1]	-0.32	0.09	-0.50 –	-0.14	-.22	-3.47	.001
Religious affiliation: Church of England[2]	8.35	2.68	3.15 –	13.61	.60	3.12	.002
Religious affiliation: Other[2]	7.35	2.40	2.66 –	12.09	.53	3.07	.003
Used IXL English	**4.63**	**1.83**	**1.13 –**	**8.14**	**.17**	**2.53**	**.012**

Note. Dependent variable: percentage of students reaching proficiency on the 2023 KS2 English grammar, punctuation and spelling assessment. *b* = unstandardised regression coefficient, *SE* = standard error, CI = confidence interval, β = standardised regression coefficient.
[1] Grand-mean centred.
[2] Dummy coded; no religious affiliation as reference group.