

The Impact of IXL on Maths Learning in England

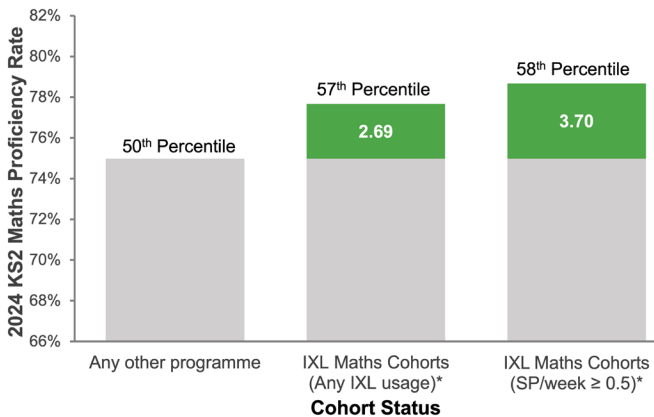
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IXL is an all-in-one teaching and learning platform that engages learners in Reception to Year 13 with a complete curriculum (aligned with England’s national curriculum) and personalised guidance for meeting learning goals. [Prior research](#) has consistently reported significant positive effects of IXL on students’ learning, including in a Northamptonshire primary school (Schonberg, 2023), in a countrywide study across England (Hargis Becker, 2024), 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 maths Standard Assessment Tests (KS2 SATs) attainment among Year 6 students across England. Key finding¹:

- **IXL Implementation improves student attainment.** Students who used IXL Maths performed better on the KS2 SATs for maths. Specifically, the proficiency rate² was between two and three percentage points higher for IXL Maths cohorts than cohorts using any other programme.



Study Design and Methodology

DATA SOURCES

Assessment and Demographic Data

We obtained assessment and demographic data from England’s Department for Education (DfE). This study analysed proficiency rates for maths on the KS2 SATs in 2023 (pretest) and 2024 (posttest). More information can be found on the [DfE website](#).

IXL Usage Data

We obtained IXL usage data 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 0.81 skills per week (see Table 1).

Table 1. IXL Maths Usage During the 2023-24 School Year

Weekly IXL usage	M	SD	Min	Max
Time spent (in minutes)	11.08	13.53	0.06	117.18
Questions answered	32.21	40.96	0.03	304.79
Skills proficient	0.81	0.87	0.00	5.66

PARTICIPANTS AND DESIGN

We compared the proficiency rates of cohorts that used IXL during the 2023-24 school year to the proficiency rates of cohorts that did not use IXL during this time (but likely used a combination of other products). Because there was a wide range of IXL Maths usage among grade-level cohorts, we examined the impact of IXL Maths at two different usage thresholds: students with any amount of IXL usage and students who

¹ *indicates statistical significance at the $p < .05$ level. SP/week = skills proficient per week, the weekly average number of IXL skills in which students reached proficiency (i.e., a SmartScore of 80+).

² Proficiency rate: percentage of students in a cohort classified as meeting the expected standard on the KS2 SATs for maths.

reached proficiency in at least 0.5 skills per week on average (≥ 0.5 SP/week). This 0.5 SP/week threshold allowed us to consider cohorts that had a meaningful amount of IXL usage (i.e., averaging proficiency in one new maths skill every two weeks), while also maximising sample size.

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 Becker, 2025). We obtained a sample of 308 cohorts (treatment $n = 154$, comparison $n = 154$) for the first analysis and 178 cohorts (treatment $n = 89$, comparison $n = 89$) for the second analysis 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 2024 KS2 SATs proficiency rate for maths on IXL Maths cohort status (treatment or comparison). In both analyses, we controlled for pretest performance and demographic characteristics (for a complete list of covariates, see Table A2 in the Appendix). 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; Hedges' g). 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 2024 KS2 maths assessment. Specifically, for IXL Maths cohorts with any amount of IXL usage, the maths proficiency rate increased by 2.69 points ($p = .04$; Hedges' $g = 0.17$). For IXL Maths cohorts where students reached at least 0.5 SP/week on average, the maths proficiency rate

increased by 3.70 points ($p = .01$; Hedges' $g = 0.19$). This means that, relative to non-IXL cohorts, IXL Maths cohorts with any amount of IXL usage saw 2.69% more students meet the expected standard, and IXL Maths cohorts reaching at least 0.5 SP/week saw 3.70% more students meet the expected standard on the KS2 SATs for maths. The effect sizes of 0.17 and 0.19 correspond to percentile gains of 7 and 8 points, respectively. See Table A2 in the Appendix for detailed results.

Conclusion

In this study, we investigated the impact of IXL Maths on student learning in England. We found that cohorts using IXL Maths performed better on the KS2 maths assessment than cohorts using any other programme. Specifically, our findings indicate that schools in England would see a 2-4 point boost in the percentage of students meeting expected standards on the KS2 SATs for maths if they implemented IXL and students used it consistently. Importantly, reaching a higher threshold of IXL Maths usage among the treatment group was associated with greater KS2 SATs maths gains relative to the comparison group.

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 Becker, 2024; IXL Learning, 2018, 2024; Schonberg, 2023). Based on these findings and prior studies, implementing IXL can help teachers increase learning growth in maths 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' Attainment and Demographics

	Treatment	Comparison
# of cohorts	154	154
Pretest and posttest		
2023 KS2 overall % proficient	59.73 (16.32)	59.48 (15.52)
2024 KS2 maths % proficient	73.94 (15.65)	72.05 (16.59)
Demographics		
% Boys	51.86 (9.10)	52.21 (9.66)
% Economically disadvantaged ¹	33.21 (18.21)	35.21 (19.57)
% Non-mobile	90.96 (10.50)	91.62 (6.86)
% English language learners	25.73 (23.54)	24.16 (24.68)
% Special education needs	21.25 (12.52)	20.82 (11.55)
Affiliated with religion(s)	33.77%	35.06%
Total enrolment	335.08 (162.28)	310.90 (171.07)

Note. Numbers in parentheses show standard deviations. Sample demographics for the other efficacy analysis were quite similar to the demographics reported here; therefore, we report the demographics for the sample used in the any IXL usage analysis as it was the broadest sample analysed.

¹As indicated by eligibility for free school meals.

Table A2. Full IXL Maths Efficacy Model Predicting 2024 KS2 Maths Proficiency Rate

Predictor	<i>b</i>	<i>SE</i>	95% CI		β	<i>t</i>	<i>p</i>
(Intercept)	74.98	0.90	73.22	– 76.76	.01	83.16	< .001
2023 KS2 % proficient ¹	0.50	0.05	0.41	– 0.59	.49	10.92	< .001
% Boys ¹	0.01	0.07	-0.13	– 0.14	.00	0.08	.940
% Economically disadvantaged ¹	-0.08	0.04	-0.16	– 0.00	-.09	-2.05	.041
% Non-mobile ¹	0.07	0.08	-0.07	– 0.22	.04	0.97	.332
% English language learners ¹	0.06	0.03	0.00	– 0.12	.08	1.83	.069
% Special education needs ¹	-0.42	0.06	-0.55	– -0.30	-.32	-6.57	< .001
Religious affiliation: Catholic ²	-3.60	2.22	-7.89	– 0.73	-.07	-1.62	.106
Religious affiliation: Other ²	-6.00	1.63	-9.15	– -2.81	-.16	-3.69	< .001
Total enrolment ¹	0.00	0.00	-0.01	– 0.01	-.02	-0.45	.650
IXL treatment effect:							
Used IXL Maths (any amount)	2.69	1.29	-0.08	– 4.96	.15	1.91	.044
Used IXL Maths (SP/week ≥ 0.5)	3.70	1.56	0.62	– 6.70	.13	2.37	.019

Note. Dependent variable: percentage of students reaching proficiency on the 2024 KS2 maths assessment. *b* = unstandardized regression coefficient, *SE* = standard error, CI = confidence interval, β = standardized regression coefficient.

¹ Grand-mean centred.

² Dummy coded; no religious affiliation as reference group.