

The Impact of Imagine Math on ISAT Performance: 2021–2022

Introduction

Imagine Math is an engaging digital program that helps students build confidence and foundational math skills by combining a rich curriculum with fun, adaptive digital experiences. Using a rigorous curriculum that adapts to the unique needs of each learner, Imagine Math supports students in achieving mastery at their grade level. For more information about Imagine Math, visit imaginelearning.com.

Several school districts in Idaho use Imagine Math to support math learning among students of diverse academic abilities and standing. Districts use Imagine Math in a variety of ways, and Imagine Learning recommends students use the program until they pass at least 30 lessons over the course of the school year.

The purpose of this report is to evaluate the impact of Imagine Math on mathematics achievement for Idaho students in Grades 4–8. To measure mathematics achievement, Imagine Learning recruited four school districts to share Idaho State Assessment Test (ISAT) math assessment scores from Spring 2021 and Spring 2022 for students in Grades 4–8 who used Imagine Math during the 2021–2022 school year ($N = 4,237$).¹ Basic characteristics of the combined sample of students are in **Table 1**.²

Table 1. Demographics of sample

Student Group	N
Grade 4	1,058
Grade 5	1,091
Grade 6	1,116
Grade 7	540
Grade 8	432
% American Indian or Alaskan Native	3%
% Hispanic or Latino	18%
% White	78%
% Other Races	2%
% English Learner	7%
% Special Education	11%

Analysis

The primary research questions this analysis is designed to answer are:

1. What is the relationship between software usage (active time, progress, completion) and performance on the ISAT Math assessment?
2. How does Imagine Math differentially affect student achievement based on grade level, English learner status, special education status, ethnicity, and/or free or reduced-price lunch status?

¹Idaho students are required to take the ISAT math assessment in Grades 3–8 and in Grade 11. For more information about the ISAT, visit <https://www.sde.idaho.gov/assessment/isat-cas/>.

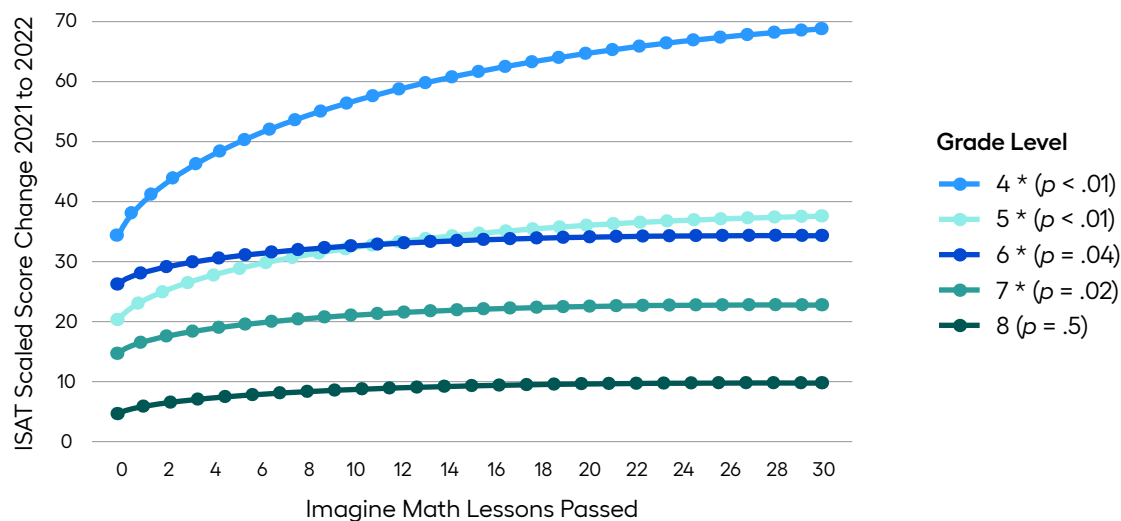
²Note that Imagine Learning additionally requested information related to free and reduced-lunch status and gender, but one out of the four school districts was not able to provide each of those two metrics.

RESEARCH QUESTION 1

To answer the first research question, multiple linear regression and matched comparison analyses were used to explore the association between the number of Imagine Math lessons passed and students' growth on the ISAT. Lessons passed is a particularly helpful metric as it indicates both program use and engagement.³

The multiple linear regression model controls for a student's Spring 2021 ISAT score and investigates the relationship between the number of Imagine Math lessons a student passed and their ISAT scaled score growth between the Spring 2021 and Spring 2022 assessments. The relationship between lessons passed and ISAT growth is positive for all grades and statistically significant for Grades 4–7 (see **Figure 1**). This indicates that students are expected to experience more growth if they pass more Imagine Math lessons.

Figure 1. Association Between Imagine Math Lessons Passed and ISAT Scaled Score Growth



Note: * indicates that the relationship between Imagine Math lessons passed and ISAT scaled score change is statistically significant for the given student subgroup ($p < .05$).

To further isolate the impact of Imagine Math, students who passed more lessons in Imagine Math were matched to students who passed fewer lessons. Propensity score matching was used to ensure that students in each study group were highly similar based on baseline performance (Spring 2021 ISAT scaled score) and demographic factors (grade, race/ethnicity, special education status, and English learner status).⁴ Students who passed more lessons in Imagine Math showed significantly greater ISAT scaled score growth from Spring 2021 to Spring 2022 than students who passed fewer lessons ($p < .05$, see **Table 2** and **Figure 2**).

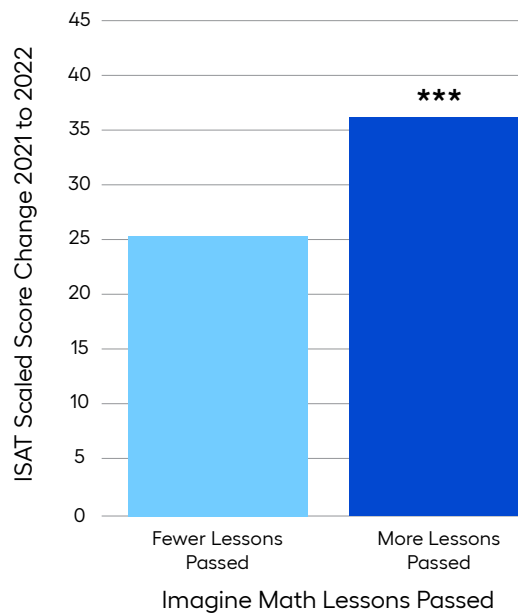
Table 2. Average 2021–2022 ISAT Math Scaled Score Growth by Imagine Math Study Group

Study Group	# of Students	Avg. Imagine Math Lessons Passed	Avg. Spring 2021 ISAT Scaled Score	Avg. Spring 2021–2022 ISAT Scaled Score Growth	p-value of Difference
Fewer Lessons Passed	1,505	1.5	2,491.0	25.1	
More Lessons Passed	1,505	19.9	2,493.6	35.1	<.001

³ A lesson is considered passed if a student completes the lesson and finishes the post-quiz with at least 75% accuracy.

⁴ Students are placed in the more lessons passed group if they passed more than the median for their grade level (5 lessons for Grades 4 and 6, 7 lessons for Grade 5, and 1 lesson for Grades 7 and 8).

Figure 2. Average Spring 2021 to Spring 2022 ISAT Growth by Lessons Passed in Imagine Math



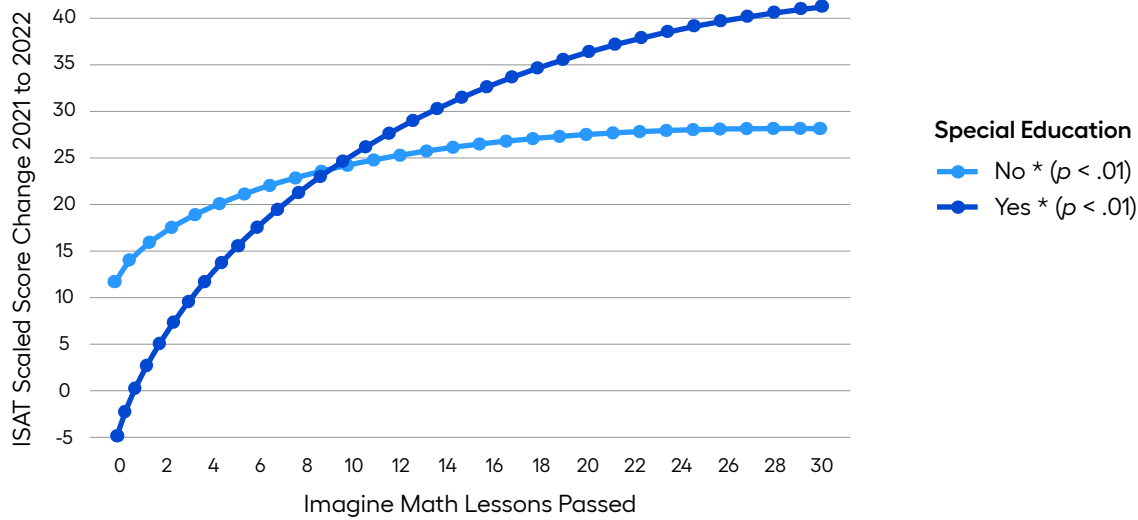
Note: *** indicates that the difference is statistically significant with $p < .001$.

RESEARCH QUESTION 2

To answer the second research question, multiple linear regression was used to explore the relationship between Imagine Math lessons passed and growth on the ISAT for various student subgroups. For example, **Figure 3** shows the relationship between lessons passed in Imagine Math and ISAT growth based whether a student is in a special education program.

This regression model controls for a student's baseline Spring 2021 ISAT scaled score, as well as other demographic information about the student (such as race, English language learner status, and free or reduced-price lunch eligibility). It shows that students in the special education program eventually exceed the growth of other students.

Figure 3. Association Between Imagine Math Lessons Passed and ISAT Scaled Score Growth By Special Education Status



Similar patterns emerge when investigating the relationship between Imagine Math lessons passed and ISAT growth for English language learners (Figure 4) and based on free or reduced-price lunch status (Figure 5). After controlling for students' baseline academic ability and other demographic characteristics, English language learners and students who are eligible for free or reduced-price lunch experience more growth as they pass more lessons in Imagine Math.

Figure 4. Association Between Imagine Math Lessons Passed and ISAT Scaled Score Growth By English Language Learner Status

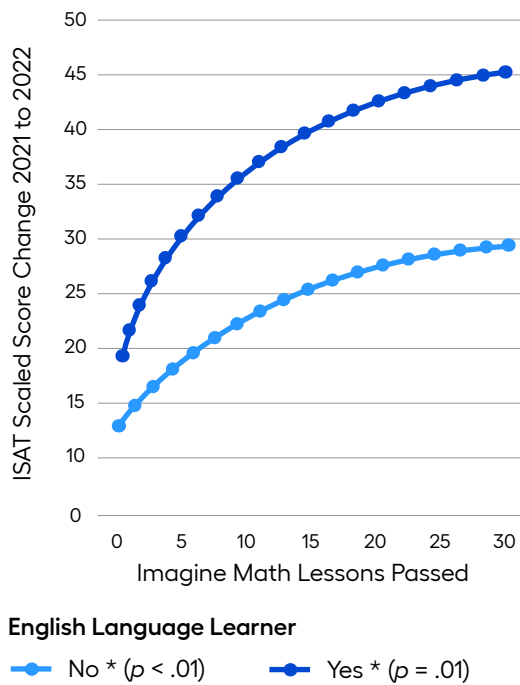
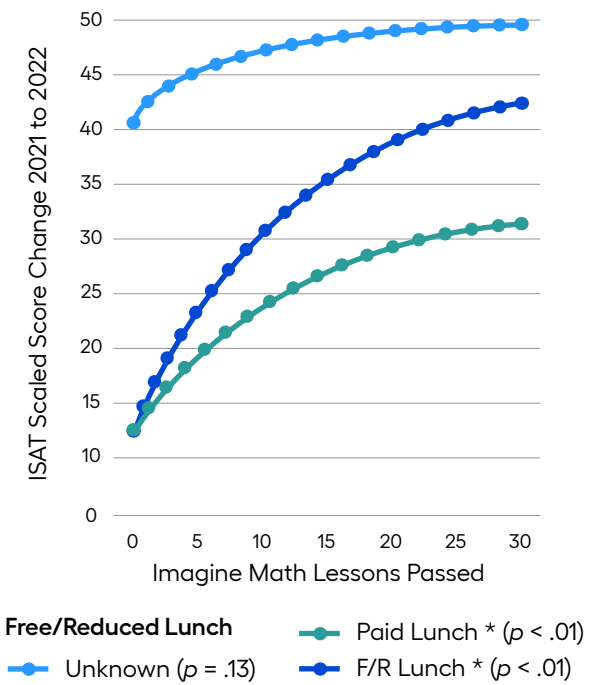


Figure 5. Association Between Imagine Math Lessons Passed and ISAT Scaled Score Growth By Free or Reduced-Price Lunch Status

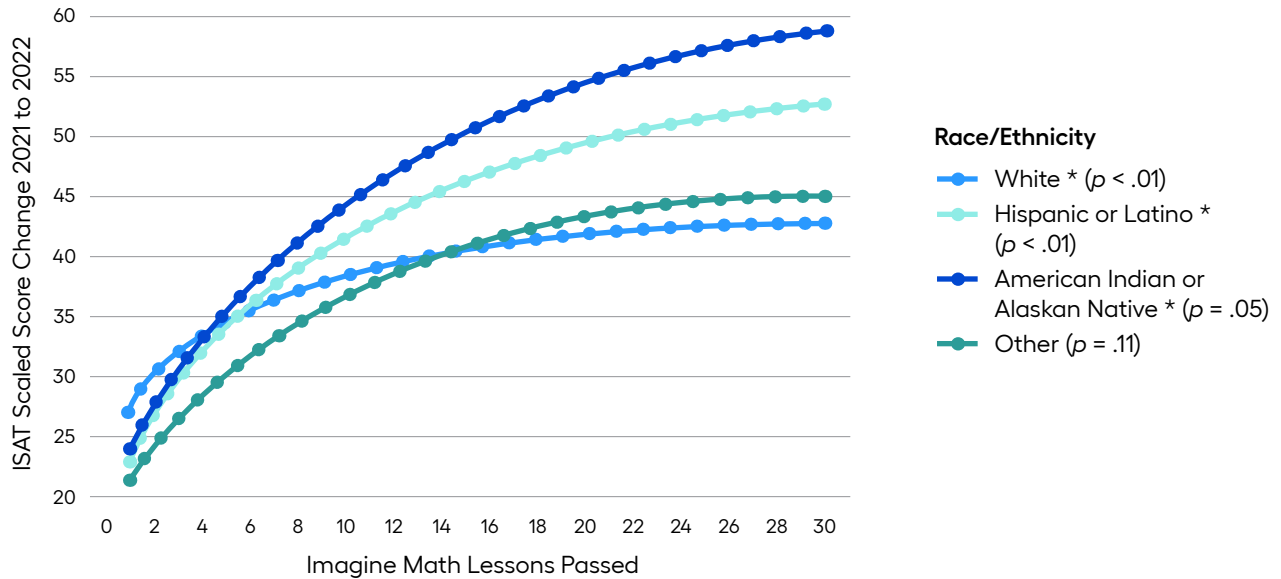


Note: * indicates that the relationship between Imagine Math lessons passed and ISAT scaled score change is statistically significant for the given student subgroup ($p < .05$).



Finally, students in racial minorities experience more growth as they pass more lessons in Imagine Math (Figure 6). After controlling for students' baseline academic ability and other demographic characteristics, Hispanic or Latino and American Indian or Alaskan Native students exceeded the growth expected for White students.

Figure 6. Association Between Imagine Math Lessons Passed and ISAT Scaled Score Growth By Race/Ethnicity



Note: * indicates that the relationship between Imagine Math lessons passed and ISAT scaled score change is statistically significant for the given student subgroup ($p < .05$).

Conclusion

Using over four thousand student records throughout the state of Idaho, Imagine Learning found statistically significant associations between math achievement and use of Imagine Math during the 2021–2022 school year. Specifically, students who passed more lessons in Imagine Math experienced statistically significantly more growth on the ISAT math assessment than students who passed fewer lessons. Further, there are positive and significant relationships between Imagine Math lessons passed and ISAT math score growth for various student subgroups, including special education students, English learners, students who are eligible for free or reduced-price lunch, and Hispanic/Latino or American Indian/Alaskan Native students. The results of this report provide evidence that Imagine Math is supporting Idaho students' mathematics achievement. Imagine Learning expects similar student populations within the state of Idaho would achieve similar gains.