imagine math

2018–2019 Imagine Math PreK–2 Correlation Analysis

BACKGROUND

Imagine Math PreK–2 is an online, supplemental software program for students in pre-K through second grade that teaches foundational skills and knowledge essential to future success in mathematics. The program builds conceptual understanding through a combination of age-appropriate instructional exercises, educational animations, and detailed explanations.

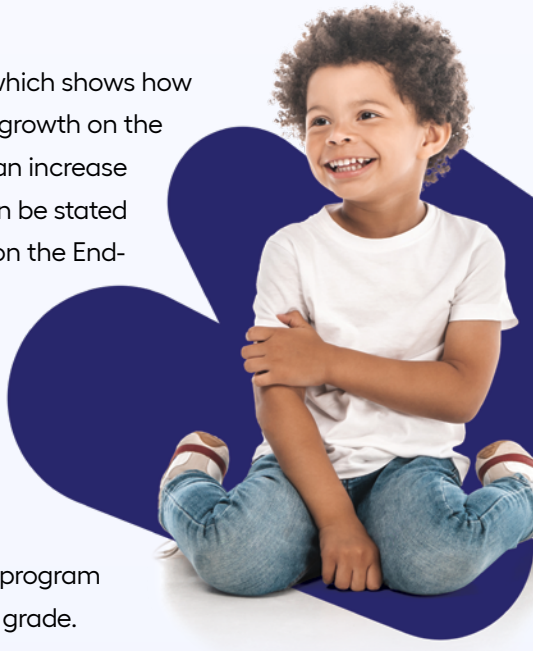
One component of Imagine Math PreK–2 is an adaptive, diagnostic assessment that students take at the beginning and at the end of the year. The assessment measures a student's level of readiness in three domains: (a) Numbers, Counting, and Cardinality, (b) Addition and Subtraction, and (c) Geometry, Measurement, and Logic. Questions within each domain vary in difficulty across grade levels.

METHOD

During the 2018–2019 academic year, 746 schools across 277 districts in 41 different U.S. states implemented Imagine Math PreK–2. Among users of the program, 59,492 students in grades PreK–1 completed both the beginning- and end-of-year assessments and make up the sample for this analysis. By grade, the sample included 8,293 PK students, 22,718 K students, and 28,481 1st grade students who completed both assessments. Students that did not have both assessments were removed from the sample. Researchers examined the assessment results to see how students' usage of the program contributed to growth on the End-of-Year assessment.

RESULTS

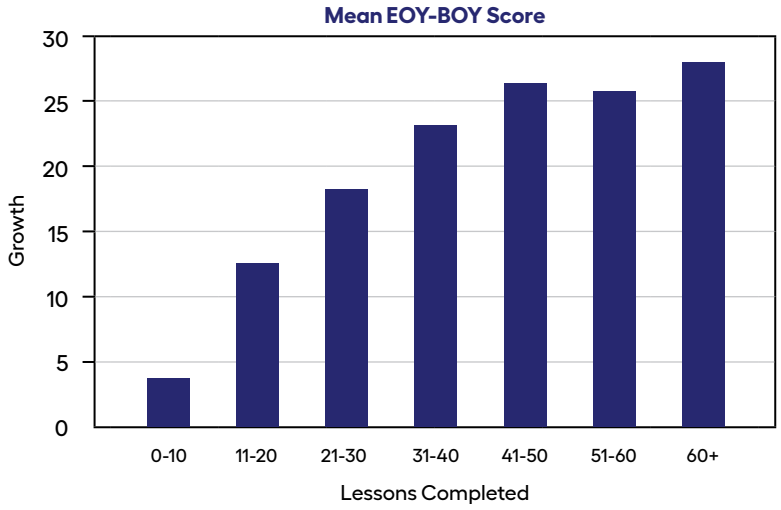
The results indicate a positive relationship between number of lessons completed and students' academic growth on their End-of-Year assessment. Figure 1 presents the results in terms of number of lessons completed and shows that for students in pre-K through first grade who completed more lessons demonstrated more growth than students who completed fewer lessons.



More details of the strength of the relationship are presented in Figure 2, which shows how lessons completed, minutes on program and tokens earned contribute to growth on the End-of-Year assessment. On average, for every lesson completed there is an increase between 0.317 to 0.340 on the students' End-of-Year score. Therefore, it can be stated that on average, it took nearly 3 lessons completed to increase the score on the End-of-Year assessment by one point across all students. Similarly, on average, an additional 90 minutes of program usage or 14 tokens earned was associated with a one-point growth on the End-of-Year assessment.

Ordinary least squares regression was also used to evaluate whether growth can still be demonstrated if grade level of students is controlled for. Results showed that student growth is consistent across all grades. Table 1 displays on average the number of lessons completed, minutes of program usage, and earned tokens that contribute to one point of growth for each grade.

Figure 1. Growth versus number of lessons completed.



Lesson Buckets	Student Count	Mean EOY-BOY Score
0-10	18679	3.54
11-20	17733	12.68
21-30	9603	18.43
31-40	5117	23.09
41-50	2933	26.01
51-60	1744	25.72
60+	3683	28.08

Figure 2. Summary of dosage indicators associated with one-point growth on the EOY assessment.

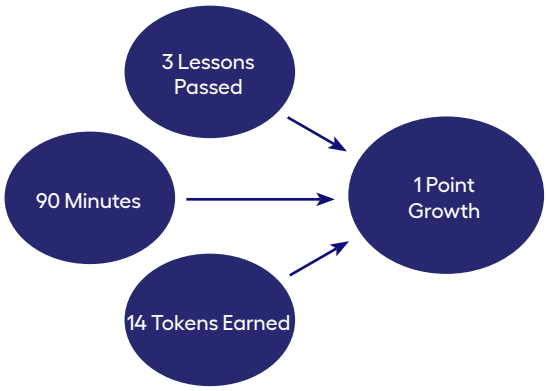


Table 1. Equivalent activities to obtain one point of growth across grades.

	PreK	Kindergarten	1st Grade
Lessons Completed	3.48	2.21	2.8
Minutes on program	125	76	86
Tokens Earned	15	10.2	16

CONCLUSIONS

The results demonstrate that growth on the Imagine Math PreK–2 assessment is positively correlated with the number of lessons students complete. Students who completed more Imagine Math PreK–2 lessons demonstrated higher growth than students who completed fewer lessons. This provides promising evidence that the program is effective for pre-K, Kindergarten, and first grade students. It should be noted that for this analysis, some students did not meet recommended levels of usage. We expect that students would demonstrate even greater growth with fidelity of usage.