

Frax + Reflex Help All Students Reach Academic Growth Goals

Results from Frax and Reflex usage and i-Ready Diagnostic Assessment Growth

Study Sample:

- 1,556 3rd and 4th grade students
- Large, suburban school district in Florida
- District's minority enrollment is over 60% and 35% of students are economically disadvantaged.
- 2021-2022 school year
- Completed i-Ready diagnostic assessments in both Fall 2021 and Spring 2022

Product Usage:

- Three groups of students based on product usage:
 - No usage (<5 days Reflex and <5 Frax missions) $n = 965$
 - Reflex + Frax (40+ days Reflex and 20+ Frax missions completed) $n = 591$

Analyses Conducted:

- Correlational analysis comparing student scale score changes from Fall 2021 to Spring 2022 across usage groups
- Typical and stretch growth metric goal attainment compared across usage groups
- Analysis conducted separately by Fall Relative Placement Levels (on vs below grade level)

Extensive research and virtually all standards bodies have identified fractions proficiency and math fact automaticity as foundational pillars of elementary math education because of their centrality to future learning. Math fact automaticity, the ability to recall basic math facts quickly and effortlessly, is predictive of long-term success in mathematics including performance on the SAT. Similarly, fractions knowledge in 5th grade uniquely predicts students' mathematics performance in high school. Unfortunately, large numbers of U.S. students fail to develop these critical foundations, which undermines their ability to master more advanced material that builds on them.

“Computational facility requires the automatic recall of addition and related subtraction facts, and of multiplication and related division facts.”

“The teaching of fractions must be acknowledged as critically important and improved before an increase in student achievement in algebra can be expected.”

National Math Advisory Panel, Final Report (2008)

INTRODUCTION

The current research report provides evidence of the efficacy of Reflex and Frax for supporting students' academic growth. In this sample of 1,556 students in 3rd and 4th grade from a large, suburban school district in Florida, students completed a baseline assessment (Fall 2021) and a follow-up assessment (Spring 2022) using i-Ready Diagnostics. During the course of the school year, all schools in the district had access to Reflex and Frax. The current analysis focuses on two groups of students:

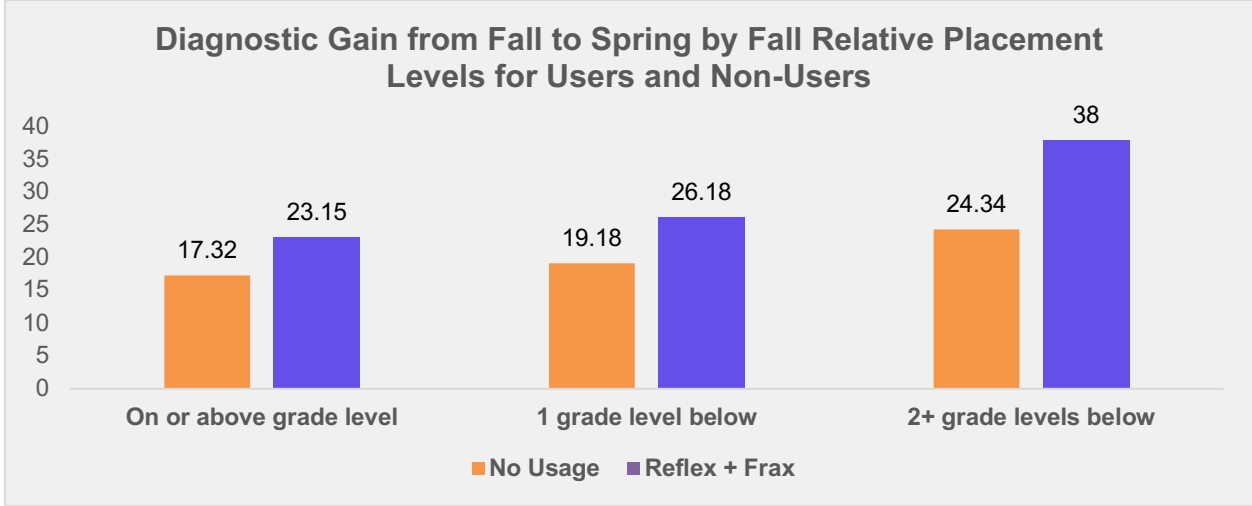
- **Non-users:** 965 Students who did not use Reflex or Frax (0-5 total days of Reflex and 0-4 Frax missions completed)
- **Reflex + Frax users:** 591 students who used Reflex 40+ days and completed 20 or more Frax missions. These students averaged 81 days of Reflex use (range 40-203 days) and 26 Frax missions (range 20-27).

Researchers analyzed associations between program usage and growth on i-Ready Diagnostics. In all the analyses here, **overall math scale scores** were used to provide the best test of the impact of Frax and Reflex on student’s ability to perform grade-level mathematics. i-Ready classifies students into criterion-referenced grade-level placements based on scale scores: **on-grade level or above, 1 grade level below, or two or more grade levels below**. Fall relative placements were used to create equivalent baseline groups.

i-Ready generates two measures for every student that can be used to determine if a student is on track to meet annual growth goals. **Typical growth** is the average annual growth of students at each grade and baseline placement level. **The recommendation for growth goals for groups of students is to exceed 100% median progress**. **Stretch growth** is the growth needed for students to advance their proficiency levels. **The recommendation for stretch goals for groups of students is aim for as many students as possible reaching stretch growth**.

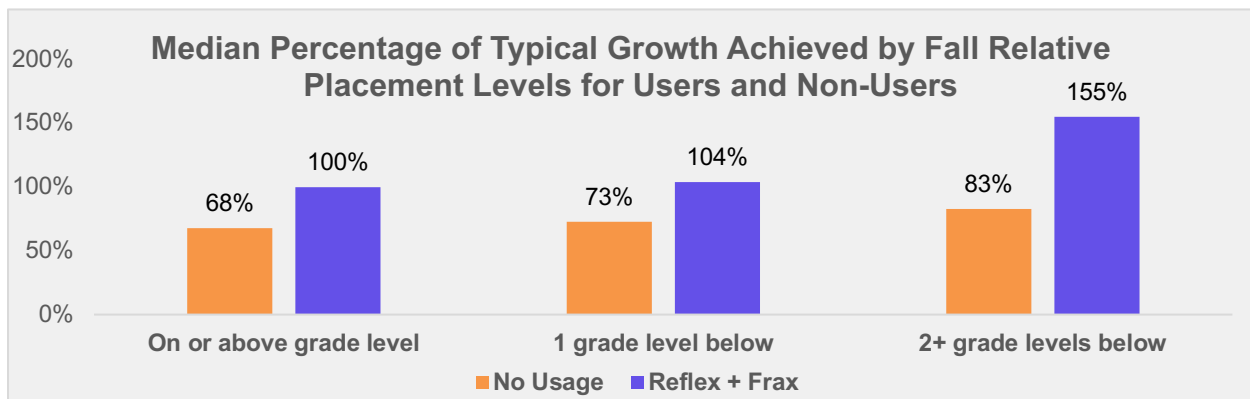
FINDING 1: Students in 3rd and 4th grade who used Frax and Reflex achieved larger academic growth from Fall 2021 to Spring 2022 compared to non-users

The graph below demonstrates average scale score increases for groups of students by Fall relative placement levels for users and non-users. Across all three achievement levels, students who used Frax and Reflex had larger score gains compared to non-users. The largest benefit of Reflex and Frax was observed in students who scored 2 or more grade levels below at baseline, **with students in this academically at-risk group who used Frax and Reflex experiencing 60% larger score gains compared to similar non-users.**

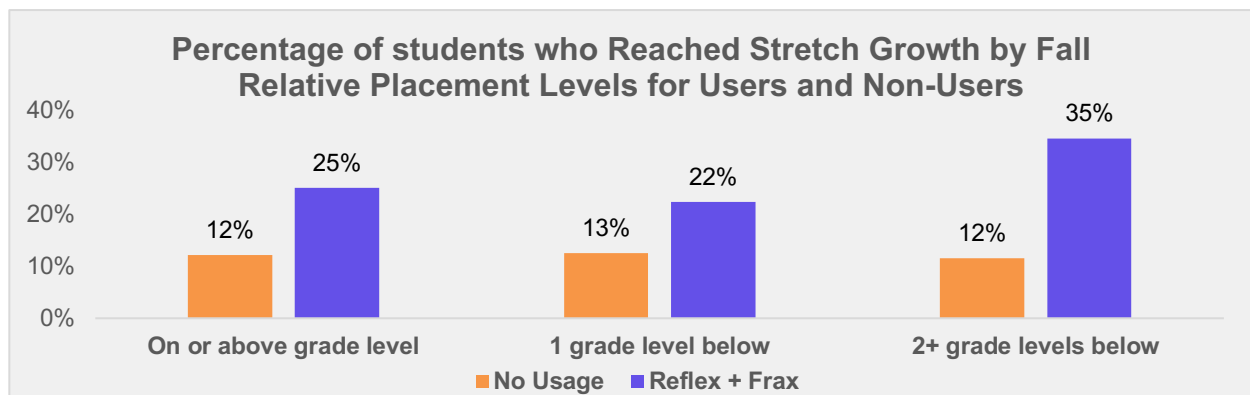


FINDING 2: Students who used Frax and Reflex were more likely to achieve growth goals than non-users, with the greatest gains observed in the most academically at-risk students

The graph below shows the median percentage of typical growth scores achieved by students across the three baseline relative placement categories for users and non-users. **Only students who used Frax and Reflex achieved the 100%+ median progress towards typical growth scores**, meeting the i-Ready Diagnostic goal recommendation. Students who scored 2 or more grade levels below at baseline achieved almost double the growth of non-users in the same baseline placement level. **Across all students, students who used Frax and Reflex were 1.6x more likely than non-users to meet or exceed their typical growth goals.**



The graph below shows the percentage of users and non-users at each baseline placement level who met or exceeded their stretch growth scores. Across all groups, **Frax and Reflex users were 2x more likely than non-users to reach these aspirational goals.** In particular, students who scored 2 or more grade levels below at baseline were nearly 3x as likely to reach their stretch goals compared to non-users in the same baseline placement level.



For additional insights and findings from this data set, please read the [full-length Technical report of this research study](#), designed to satisfy Tier II evidence according to the Every Student Succeeds Act (ESSA), and reach out to research@explorelarning.com with any additional questions.