

Curriculum Associates RESEARCH

Fluency Flight Has a Positive Impact on Students' Math Fact Fluency

Mathematics

Research Summary | June 2023

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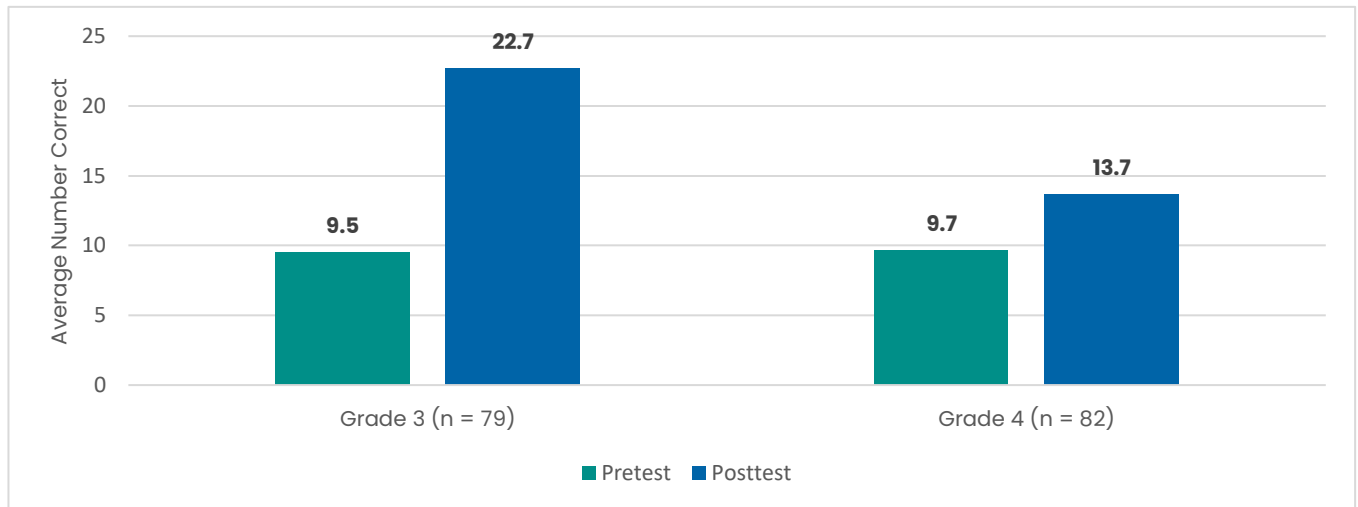
This study aimed to investigate the effectiveness of Fluency Flight, a game-based math fact fluency program, on student learning outcomes. The study included a sample of nearly 400 students in Grades 3 and 4 from three different schools. The results indicate that students who used Fluency Flight improved in their math fact fluency. Descriptively, students who used Fluency Flight experienced greater improvement in accuracy than those who did not use it, although the differences were small and not statistically significant. These findings suggest that Fluency Flight may be a valuable tool for improving math fact fluency in young students.

Key Findings

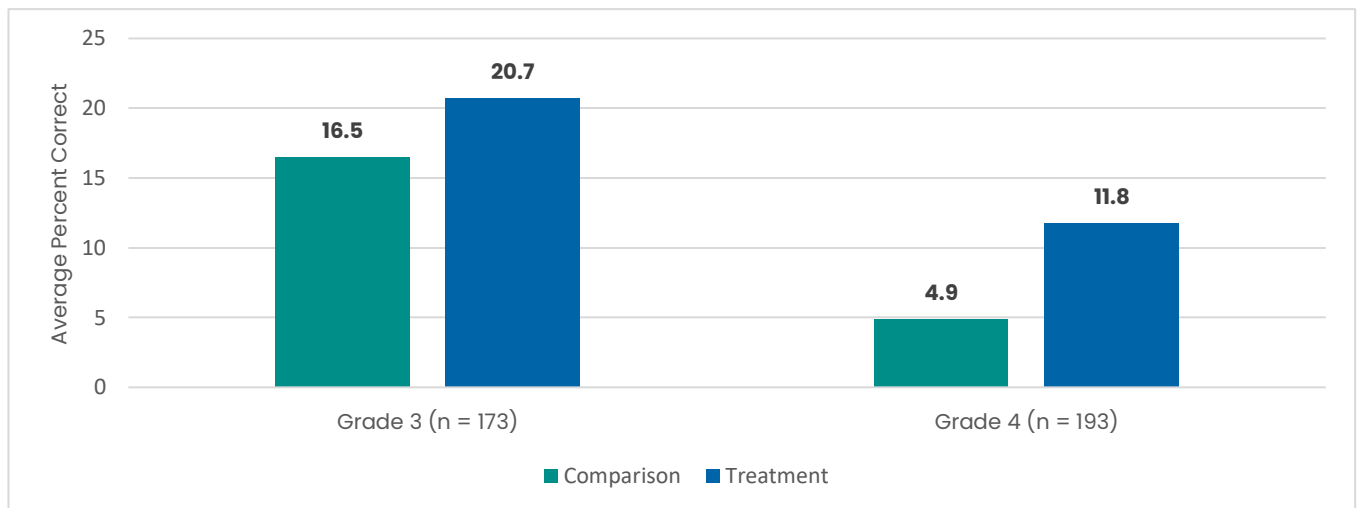
Students Using Fluency Flight Improved in Math Fact Fluency

- Students in Grades 3 and 4 who used Fluency Flight improved in math fact **fluency** (i.e., accuracy and speed) from pretest to posttest. These improvements were statistically significant.
- Descriptively, students in Grades 3 and 4 who used Fluency Flight saw greater improvements in accuracy than the comparison group students. These improvements were not statistically significant.

Graph 1: Students Using Fluency Flight Improved in Fluency



Graph 2: Students Using Fluency Flight Improved in Accuracy



Study Overview

This research was conducted to examine the effectiveness of Fluency Flight in improving students' math fact fluency. Students in one medium-sized, suburban school district in the mid-Atlantic were non-randomly assigned to receive either Fluency Flight's game-based approach or the business-as-usual approach, which included timed tests and use of rote memorization. District leaders were optimistic that the use of Fluency Flight would boost student performance. As such, treatment group classrooms were selected for having lower state test scores than the district average. All 10 classrooms in the treatment group came from one Title I school, and the 10 classrooms in the

comparison group came from two non-Title I schools. The study took place from October 2022 to January 2023.

Fluency Flight is a supplemental, game-based digital tool designed to help students in chronological Grades 2–5 build math fact fluency in addition, subtraction, multiplication, and division. Math fact fluency refers to the ability to recall basic arithmetic facts quickly and accurately. It is an essential component of math proficiency and is typically taught in elementary school. Fluency Flight’s digital activities and games cover facts and strategies that progress through the four stages of fluency: basic understanding, accuracy, automaticity, and maintenance. It is recommended that students use Fluency Flight for four days per week, and students are assigned two activities to complete each day (which amounts to roughly eight to 10 minutes of usage per day).

Within the study sample, there was substantial variability across the treatment group’s usage in both grades. On average, Grade 4 students used Fluency Flight approximately three to four times per week, whereas Grade 3 students used Fluency Flight less often—approximately two to three times per week, on average. Math fact fluency assessments served as the outcome measure and measured accuracy, speed, and fluency (i.e., accuracy and speed). Findings from this study provide evidence that students who used Fluency Flight saw statistically significant improvements in math fact fluency. Additionally, students who used Fluency Flight grew substantially more than the comparison group students with respect to accuracy. However, this difference was not statistically significant.

Research Methodology

The study was conducted using a quasi-experimental design, with students non-randomly assigned to either an experimental group that used the Fluency Flight math fact fluency program or a control group that did not use the program. The research questions that guided this analysis are as follows:

1. Do students who use Fluency Flight improve in their math fact fluency?
2. Do students who use Fluency Flight experience greater improvement in their math fact fluency than students who do not use Fluency Flight?
3. Do students who use Fluency Flight more often experience greater improvement in their math fact fluency than students who use the product less often?

Math fact fluency assessments were developed by Curriculum Associates’ editorial team and administered to both groups at the beginning and end of the study to measure any changes in fluency. The data collected was analyzed using a variety of statistical methods, including an ANCOVA to control for differences in math fact fluency at pretest. The study lasted for 12 weeks, during which time all students received regular classroom instruction in math. The treatment group students used the Fluency Flight program in addition to their regular instruction, while the comparison group engaged in a more traditional form of fluency practice, involving rote memorization drills and timed practice tests, in addition to their regular instruction.

The study took place in one medium-sized, suburban school district in the mid-Atlantic with a final analytic sample of 366 students in 10 Grade 3 classrooms and 10 Grade 4 classrooms. All five treatment group classrooms in each grade were selected from one Title I elementary school with approximately 35% students of color and 40% of students with socioeconomic disadvantages. All five comparison group classrooms in each grade were selected from two non-Title I elementary schools. One comparison school had approximately 25% students of color and 25% of students with socioeconomic disadvantages, and the other comparison school had approximately 17% students of color and 15% of students with socioeconomic disadvantages.

[Read the full research report](#) to learn more.

Full Report Reference

Pope, A. (2023). *Evaluating the impact of Fluency Flight on math fact fluency: A preliminary research study*. Curriculum Associates.