Greater usage of Happy Numbers related to higher math achievement for kindergarten and 1st grade students

Happy Numbers contracted with LearnPlatform by Instructure, a third-party edtech research company, to examine the relationship between student usage of the Happy Numbers platform and math outcomes for kindergarten and first-grade students in a midwestern public school district during the 2021-22 school year. The following document highlights the study findings and outlines the study sample, measures, and methods.

Key Findings

- ★ Overall, kindergarten and first-grade students that completed more tasks on Happy Numbers had higher spring end-of-year math scores (statistically significant relationships $p < .001$).
- ★ Overall, Happy Numbers had good usage with students averaging 168 total tasks completed over the school year. There were no significant differences in usage depending on demographic subgroup membership (i.e., gender, special education status, or race/ethnicity).
- ★ Three usage clusters were identified: low usage (n = 207; mean tasks = 81), moderate usage (n = 197; mean tasks = 182), and high usage (n = 108; mean tasks = 308). Students had equivalent beginning-of-year math scores across the usage clusters[1].
    - Kindergarten students in the high usage cluster performed the best on the end-of-year math assessment[2] (mean score = 82.63), while those in the moderate usage cluster performed the second best (mean score = 47.73), and those in the low usage cluster performed the worst (mean score = 18.83).
    - Similarly, first-grade students in the high usage cluster performed the best on the end-of-year math assessment (mean score = 247.45), while those in the moderate usage cluster performed the second best (mean score = 177.87), and those in the low usage cluster performed the worst (mean score = 144.60).

The findings from this 2021-22 study meet ESSA Level III (*Promising Evidence*) standards given the positive, statistically significant relationships between Happy Numbers usage and end-of-year math scores for kindergarten and first-grade students.

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[1] An ANOVA test to check baseline equivalence indicated that there were no significant differences depending on cluster membership (F (512, 2) = 0.14, p = .872).

[2] The end-of-year assessment is aligned with the Quantile ranges, which indicate; the 75th percentile for kindergarten is a score of 35Q and a score higher than EM10Q indicates the student is very well prepared for grade level work. The 75th percentile for first-grade is a score of 255Q and a score higher than 80Q indicates a student is very well prepared for grade level work.

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About the Study

Sample

2021-2022. Students who used Happy Numbers in the 2021-22 school year (*n* = 540 students across 30 schools) were enrolled in kindergarten (51%) and first grade (49%). In terms of demographics, the sample included the following students: 2% Asian, 3% Black, 10% Hispanic, and 85% White; 49% identified as female, and 3% were receiving special education services.

Measures

Usage. Researchers utilized 2021–22 student-level usage data (i.e., total tasks completed).

Outcomes. Researchers used fall 2021 and spring 2022 Happy Numbers math test scores to evaluate math achievement. The Happy Numbers assessment was developed in partnership with Meta Metrics as it aligns with the Quantile measure. The fall 2021 scores were used as a control variable in the regression analysis.

Methods

Researchers conducted a multilevel regression analysis to examine how Happy Numbers use related to students' math outcomes in the spring, controlling for prior achievement (i.e., fall test scores), classroom-level random effects, and special education status.