Registry of Efficacy and Effectiveness Studies

Study Title:
A Randomized Field Trial of the Impact of Dysolve® on Reading Achievement

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Version History

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Updated study end date to run through June 2024.

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Section I: General Study Information

PI name: Henry May
PI affiliation: University of Delaware

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EduNational LLC

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-

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University of Delaware IRB

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Study Start Date:
2022-09-08

Study End Date:
2024-06-30

Intervention Start Date:
2022-11-03

Timing of entry:
Prior to implementation of the intervention

Brief Abstract:
The purpose of this research study is to examine the efficacy of a game-based learning platform (Dysolve) that is designed to help reduce language processing deficits in children with reading difficulties, including dyslexia. A randomized controlled trial is designed to evaluate Dysolve's impact through analysis of student's test scores in reading and English language arts (ELA) from state accountability tests and commercially developed assessments.

Keywords:
reading, dyslexia, achievement, educational technology, artificial intelligence, game-based intervention

Comments:
-

Section II starts on the next page.

Section II: Description of Study

Type of Intervention:
Curriculum/Product

Topic Area of Intervention:
Education Technology, Reading and Writing, Special Education

Number of intervention arms:
1

Target school level:
3, 4, 5, 6, 7, 8

Target school type:
Rural, Suburban, Urban

Location of Implementation:
United States: United States : Midwest, United States : Northeast, United States : South

Further description of location:
Recruitment of participating districts/schools is ongoing, with random assignment of students separately within each school. At the time of study pre-registration, participating states include Illinois, Mississippi, and New York.

Brief Description of Intervention Condition:
Students randomly assigned to receive the Dysolve® intervention will be asked to use the Dysolve Program on a computer, tablet, or Chromebook for 15-30 min./day from during the 2022-23 or 2023-24 school years, in addition to any other service routinely provided by their school. Dysolve is a computer program designed to address dyslexia and language-related disorders. Dysolve uses Artificial Intelligence to generate individually-tailored sequences of game-based training tasks that target each learner's unique problems. As it probes the root causes of the problems found, Dysolve designs increasingly targeted activities to correct them for that particular learner. Dysolve is offered in the cloud, allowing members to log on at any time, any place through their PCs or mobile devices. Dysolve is a supplemental intervention; children who are selected to use Dysolve will not miss other instructional time.

Brief Description of Comparison Condition:
Students randomly assigned to the control condition will receive "business-as-usual" (BAU) instruction and intervention already provided by their school. Students in the control condition will be able to use the Dysolve program for free next school year, after posttest data are collected for this randomized trial.

Comparison condition:
Business-as-usual

Comments:
-

Section III: Research Questions

Confirmatory research questions:

Question 1:
What is the impact of the Dysolve intervention (relative to a business-as-usual control group) on students' reading achievement in grades 3-8 as measured by state test scores and commercial assessments (e.g., NWEA's MAP test)?

Question 2:
What is the impact of the Dysolve intervention (relative to a business-as-usual control group) on students' reading behaviors in grades 3-8 as reported via student, parent, and teacher surveys?

Exploratory research questions:
Question 1:
Is the impact of Dysolve moderated by ESL status, ADHD, autism, auditory processing disorders, speech disorders, anxiety disorders, or math disability?

Question 2:
Is there an impact of Dysolve on math learning?

Comments:
-

Section IV-A: Study Design (Selection)

Study Design:
Randomized Trial (RT)

Comments:
-

Section IV-B: Study Design (Input)

Study Design: Input

Unit of random assignment of intervention:
Student

Assignment within sites or blocks:
Yes

Define the sites or blocks:
School

Probability of assignment to treatment the same across sites or blocks:
Yes

Probability of assignment to treatment:
.50

Unit outcome data measured:
Student

Intermediate clusters between unit of random assignment and unit of measurement:
No

Comments:
Students will be randomly assigned to treatment and control conditions separately (i.e., blocked) within grade level, within each school.

Design Classification

Based on the responses above, this study has been classified as:
RT: Multisite (Blocked)

Section V: Sample Characteristics

Approximate number of students in the comparision condition within each school:

Approximate number of students in the intervention condition within each school:

Number of schools: 20

Yes - Targeted students include those in grades 3-8 who scored below the 30th percentile on the previous year state test in reading/ELA for their grade. Yes - Students with visual or cognitive impairment and students with physical hearing problems will be excluded. No No
Comments:
-

Section VI: Outcomes (Input)

Confirmatory question 1: Outcome Measure 1

Outcome domain: Student Achievement - Literacy
Minimum detectable effect size: .15 if a total of 480 students from up to 20 schools can be recruited
Outcome measure: Scale scores in Reading/ELA from state accountability assessments.
Scale of outcome measure: Continuous
Normed or state test: Yes
Same outcome measure in treatment and comparison groups: Yes

Confirmatory question 1: Outcome Measure 2

Outcome domain: Student Achievement - Literacy
Minimum detectable effect size: .15 if a total of 480 students from up to 20 schools can be recruited
Outcome measure: RIT scores from NWEA's MAP Assessments
Scale of outcome measure: Continuous
Normed or state test: Yes
Same outcome measure in treatment and comparison groups: Yes

Confirmatory question 2: Outcome Measure 1

Outcome domain: Student Social, Emotional, & Behavior - Behavior
Minimum detectable effect size: .15 if a total of 480 students from up to 20 schools can be recruited
Outcome measure: Reading subscale from the Colorado Learning Difficulties Questionnaire (CLDQ)
Scale of outcome measure: Continuous

Normed or state test: No

Test-retest reliability: N/A

Internal consistency: .90

Inter-rater reliability: N/A

Same outcome measure in treatment and comparison groups: Yes

Section VII: Analysis Plan

Baseline data collected prior to start of intervention:
Yes

Description of baseline data:
Individual-level student data collected at baseline will include age, grade, gender, English learner status, diagnosed conditions (e.g., dyslexia, learning disabilities, ADHD, autism), economic disadvantage, any other special education designations, and prior year state test score

Covariates you plan to include in the model:
Grade, Student Pretest

Analytic model:
See PDF attachment in Section VIII.

Plan to handle cases with missing outcome data:
Delete cases with missing data for the outcome being analyzed

Planned multiple comparisons adjustment, confirmatory question 1 (Student Social, Emotional, & Behavior - Behavior):
Yes

Number of planned comparisons to adjust, confirmatory question 1 (Student Social, Emotional, & Behavior - Behavior):
2

Correction for multiple comparisons, confirmatory question 1 (Student Social, Emotional, & Behavior - Behavior):
Benjamini-Hochberg correction

Comments:
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Section VIII: Additional Information

Links:

https://www.cresp.udel.edu/research-project/DysolveRCT/
Dysolve RCT Project Website

Files:
File Name: Dysolve_RCT_Analysis_Plan_10192022.pdf

Description: Analysis plan and primary statistical model for impacts.

File Name: Dysolve_RCT_PowerAnalysis_10192022.pdf
Description: Power analyses based on 8 schools and 20 schools.

Comments:
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