Executive Summary:

The Relationship Between Discovery Education Market Presence and State of Texas Grades 3-12 Achievement

Prepared by McREL for Discovery Education

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Overview

The purpose of this study was to examine the relationship between Discovery Education's (DE) market presence and school-level academic achievement in the State of Texas. Specifically, the study used a correlational design, where the outcomes of interest were Spring 2019 and 2022 State of Texas Assessments of Academic Readiness (STAAR) Math, Science, English, and Social Studies school average test scores; and the focal predictor was if a school had a DE license or not (i.e., treatment or comparison).

Research Question

The current study aimed to answer one research questions:

1. Do schools with one or a combination of DE licenses (DE Learning Platform, Science Techbook, Social Studies Techbook, DE Learning Platform + Science Techbook, DE Learning Platform + Social Studies Techbook, or Mystery Science Plus) report higher achievement scores than schools who do not have a license for any DE product?

Design and Methodology

Treatment schools were identified based on if they used 1) Discovery Education Learning Platform (DE Learning Platform) only, 2) Science Techbook only, 3) Social Studies Techbook only, 4) DE Learning Platform and Science Techbook only, 5) DE Learning Platform and Social Studies Techbook only, or 6) Mystery Science and some combination of other products (termed "Mystery Science Plus")[1] during the study period from October 1, 2018 to May 31, 2019 for the 2018/19 analysis and October 1, 2021 to May 31, 2022 for the 2021/22 analysis. Comparison schools were defined based on if they did not use any DE product during both the study period and the year prior (for example, October 1, 2017 to May 31, 2019 for the 2018/19 analysis).

The sample sizes for the analyses are presented in Table 1 below. All schools in the study population are members of school districts served by the Texas Education Agency, including both traditional public schools and public charter schools.

Table 1: Sample sizes (number of schools and districts) for Research Question 1 analyses.

	2018-19 Dataset		2021-22 Dataset	
	Treatment	Comparison	Treatment	Comparison
DE Learning Platform	3,745 (District N = 697)	3,579 (District N = 787)	3,184 (District N = 631)	3,670 (District N = 798)
Science Techbook	127 (District N = 42)	3,579 (District N = 787)	109 (District N = 42)	3,670 (District N = 798)
Social Studies Techbook	5 (District N = 4)	3,579 (District N = 787)	3 (District N = 3)	3,670 (District N = 798)
DE Learning Platform + Science Techbook	231 (District N = 82)	3,579 (District N = 787)	193 (District N = 70)	3,670 (District N = 798)

[1] There were no schools that used Mystery Science only, so a Mystery Science only treatment group could not be defined.

Table 2 (Continued): Sample sizes (number of schools and districts) for Research Question 1 analyses.

DE Learning Platform + Social Studies Techbook	43 (District N = 6)	3,579 (District N = 787)	39 (District N = 5)	3,670 (District N = 798)
Mystery Science Plus	N/A[2]	N/A	200 (District N = 85)	3,670 (District N = 798)
Total Sample Size	**7,730 (District N = 1,164)**		**7,398 (District N = 1,136)**	

This study used publicly available school achievement and demographic data posted on the Texas Education Agency website[3], as well as product usage data furnished by DE. For the academic years under investigation (2018-19 and 2021-22) the State of Texas used a combination of two state assessments to capture achievement across a host of outcome domains: State of Texas Assessments of Academic Readiness (STAAR) and End of Course assessments (EOC). STARR assessments are annual assessments for mathematics at grades 3-8, reading language arts at grades 3-8, science at grades 5-8, social studies at grade 8, and EOC assessments for 9-12 Algebra I, English I, English II, Biology, and U.S. History. Since the products under study purport to address a breadth of content areas, researchers extracted school-level averages for all available outcomes. More specifically, the study used the following State of Texas achievement data:

- Elementary (grades 3-5 aggregated) Reading
- Elementary (grades 3-5 aggregated) Math
- Middle (grades 6-8 aggregated) Reading
- Middle (grades 6-8 aggregated) Math
- Grade 5 Science
- Grade 8 Science
- Grade 8 Social Studies
- High school EOC Algebra 1
- High school EOC English (English I and English II aggregated)
- High School EOC US History
- High School EOC Biology

In addition to state achievement data, the following publicly available school-level demographic data were used as statistical controls:

- Percent of students in various racial/ethnic categories (White, Black, Hispanic, and Other Race[4])
- Percent at-risk students
- Percent economically disadvantaged students
- Percent LEP students

[2] DE acquired Mystery Science after the 2018-19 analysis. Therefore, no Mystery Science Plus treatment schools were identified for the 2018-19 analysis

[3] Data can be found at: https://tea.texas.gov/student-assessment/testing/staar/staar-variables-formats-and-descriptions

[4] The racial/ethnic category "Other Race" included Asian, American Indian, Pacific Islander, and Multi-racial.

- Percent SPED students

Since the DE Learning Platform is purported to address multiple content areas, its relationship was tested against all outcome areas, while Science Techbook and Mystery Science Plus (products designed for science) were tested against science outcomes, and Social Studies Techbook against social studies outcomes. The combination treatment groups of DE Learning Platform and Science Techbook, and DE Learning Platform and Social Studies Techbook, were tested against all outcome areas since the DE Learning Platform addresses multiple content areas.

To answer the research question, researchers used a correlational design where product usage was tested against its corresponding outcome domain(s) for the 2018-19 and 2021-22 school years. The average treatment effect between treatment and school academic achievement outcomes were estimated using multiple linear regression ordinary least squares estimator, controlling for school-level covariates, including the percentage of students in various racial/ethnic categories (Black/African American, Hispanic or Latino/a, Asian, Other races), the percent of at-risk students, percent of economically disadvantaged students, percent Limited English Proficient (LEP) students, and percent Special Education (SPED) students.

Results

The following sections report instances of positive effects of DE products on student achievement. Null and negative effects are presented in the full report.

2018-19 Analysis

- DE Learning Platform had a positive relationship with HS Algebra I scores.
- DE Learning Platform + Science Techbook had a positive relationship with HS U.S. History scores.
- DE Learning Platform + Social Studies Techbook had a positive relationship with HS U.S. History scores.

2021-22 Analysis

- DE Learning Platform + Social Studies Techbook had a positive relationship with HS U.S. History scores.
- Mystery Science Plus had a positive relationship with Grade 5 Science scores.

Considerations

Four primary limitations concerning the study's internal validity should caution the direct interpretation of these findings: 1) The study did not compare effects between schools matched on covariates and prior achievement, 2) Based on how comparison schools were defined, comparison schools could have had a DE product at some point prior to being considered a comparison group, 3) Since about 10% of treatment schools were not able to be "fuzzy matched" (i.e., matched on school names instead of school IDs), it is possible that a small degree of contamination of the comparison group occurred, and 4) The study did not account for implementation of the various

DE products and cannot differentiate effects between schools that used DE products more versus less. Recommendations for subsequent inquiries into the effects of DE's market presence include:

1) Employ a quasi-experimental design to estimate the effect of DE usage on achievement gains over time where treatment and comparison schools are matched on baseline characteristics using propensity score matching;

2) Establish a true baseline for product implementation and a clean comparison group to provide more precise impact estimates;

3) Include unique school IDs in DE datasets for more accurate data merging; and

4) Conduct implementation studies (i.e., evaluation of school-level usage) to supplement future examinations of DE product impacts.