

Registry of Efficacy and Effectiveness Studies

Study Title:

Impact of Code.org's Equity in AP Computer Science Principles Initiative (EIR Early29)

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Section I: General Study Information

PI name: Elisabeth Davis

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Study Start Date:

2019-09-30

Study End Date:

2024-09-30

Intervention Start Date:

2023-06-01

Timing of entry:

Prior to implementation of the intervention

Brief Abstract:

This study evaluates the impact of Code.org's Equity in AP Computer Science Principles (Equity in AP CSP) initiative. Equity in AP CSP includes two core components. The first component, the School Leadership Program, is an outreach and recruitment program for school administrators to adopt, and for school counselors to enroll students in, AP Computer Science Principles. The second component is a blended professional learning program (Blended PL Program) for AP Computer Science Principles (AP CSP) teachers that builds on Code.org's open-source curriculum, associated in-person Professional Learning Program, and network of Regional Partners. Equity in AP CSP seeks to improve college readiness in women, underrepresented minorities (URM) and rural student populations in Alaska, Kentucky, Maine, Nebraska, New Mexico, Texas (Austin) and West Virginia, by increasing the number and percentage of students in these target populations enrolling in AP CSP and earning qualifying scores. Code.org will offer the School Leadership Program to participating schools' administrators during the 2021 /22 school year. The following year (2022/23), Code.org will provide the Blended PL Program to teachers in the school and AP CSP will be taught to students using the Code.org curriculum. The impact study will use a quasi-experimental matching design to answer confirmatory research questions (RQs) about the effect of Equity in AP CSP on students' likelihood of participating in and earning a qualifying exam score in AP CSP. The impact study will compare outcomes between students in schools that participate in Equity in AP CSP (and are offering AP CSP for the first time) with students in a matched set of similar schools that are offering AP CSP for the first time and not using Code.org curriculum. The impact study is designed to meet WWC standards with reservation.

Keywords:

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Comments:

-

Section II starts on the next page.

Section II: Description of Study

Type of Intervention:

Curriculum/Product, Professional Development

Topic Area of Intervention:

computer science education

Number of intervention arms:

1

Target school level:

10, 11, 12, 9

Target school type:

Rural, Suburban, Urban

Location of Implementation:

United States: United States : Midwest, United States : Northeast, United States : South, United States : West

Further description of location:

Recruiting in Alaska, Kentucky, Maine, Nebraska, New Mexico, Texas (Austin) and West Virginia,

Brief Description of Intervention Condition:

Code.org's Equity in AP Computer Science Principles initiative includes two core components. The first component, the School Leadership Program, is an outreach and recruitment program for school administrators to adopt, and for school counselors to enroll students in, AP Computer Science Principles. The second component is a blended professional learning program (Blended PL Program) for AP Computer Science Principles (AP CSP) teachers that builds on Code.org's open-source curriculum, associated in-person Professional Learning Program, and network of Regional Partners. All schools participating in Equity in AP CSP are implementing AP CSP for the first time, but some may use Code.org curriculum in earlier grades (e.g., Code.org's Computer Science Discoveries for grades 6–8) or for AP Computer Science A.

Brief Description of Comparison Condition:

The comparison group will be composed of students within similar schools chosen through propensity score matching. Where possible, the comparison schools will be matched within the same district, or, if this is not possible, within the same state. To construct the comparison group, each treatment school will be matched with one other school that (a) is auditing AP CSP through the College Board for the first time in fall 2023 and (b) is not using the Code.org curriculum to teach the course.

Comparison condition:

Business-as-usual

Comments:

Logic model for the intervention is attached under Section 8: Additional Materials

Section III: Research Questions

Confirmatory research questions:

Question 1:

What is the effect of Equity in AP CSP on high school students' likelihood of taking the AP CSP course in high schools offering AP CSP for the first time compared to high school students in schools implementing AP CSP for the first time and not using Code.org curriculum?

Question 2:

What is the effect of Equity in AP CSP on high school students' likelihood of earning a qualifying AP CSP exam score in high schools offering AP CSP for the first time compared to high school students in schools implementing AP CSP for the first time and not using Code.org curriculum?

Exploratory research questions:

No Questions added yet.

Comments:

-

Section IV-A: Study Design (Selection)**Study Design:**

Quasi-experimental Design with comparison group (QED)

Comments:

-

Section IV-B: Study Design (Input)*Study Design: Input***Unit of intervention implementation:**

School

Assignment within sites or blocks:

Yes

Please define the natural blocks or purposefully selected:

District

Unit outcome data measured::

Student

Intermediate clusters between unit of implementation and unit of measurement:

No

*Study Design: Matching Procedures***Comparison units will be selected at:**

Unit of implementation level, then unit of measurement level

Covariates used to select comparison:

age, Percentage Free and Reduced Lunch, Percentage of English Learners, School Location, School Pretest, School Size

Distance measure used for matching treatment and comparison:

Propensity Score

Matching method used:

-

Matching ratio (treatment : comparison):

1:1

Covariates used to select comparison:

-

Distance measure used for matching treatment and comparison:

-

Matching method used:

-

Matching ratio (treatment : comparison):

-

Comments:

-

Design Classification

Based on the responses above, this study has been classified as:

QED: Multisite (Blocked) Nested

Section V: Sample Characteristics

Approximate number of students per school: 20

Approximate number of schools in the comparison condition within each district: 40

Approximate number of schools in the intervention condition within each district: 40

Number of districts: 30

No No Yes - schools where AP-CSP is being taught for the first time Yes - schools who have been offering AP-CSP prior to study No No

Comments:

-

Section VI: Outcomes (Input)

Confirmatory question 1: Outcome Measure 1

Outcome domain: Student Achievement- Enrolling in AP-CSP
Minimum detectable effect size: Between .19 and .30
Outcome measure: Enrollment in AP-CSP
Scale of outcome measure: Binary
Normed or state test: No
Test-retest reliability: N/A
Internal consistency: N/A
Inter-rater reliability: N/A
Same outcome measure in treatment and comparison groups: Yes

Confirmatory question 2: Outcome Measure 1

Outcome domain: Student Achievement- qualifying score on AP-CSP test
Minimum detectable effect size: Between .19 and .30
Outcome measure:
Scale of outcome measure:
Normed or state test:
Same outcome measure in treatment and comparison groups:

Comments:

Power analyses were conducted using PowerUp software (Dong & Maynard, 2013). The design is a two-level random effects cluster design in which an average of 20 students is nested within 80 schools and one half of students are in a school implementing Code.org. We calculate an MDES of 0.193 with 80% probability using a two-tailed test, 0.05 level of significance. This is based on the assumption that 50% of the variance in Level 1 and Level 2 outcomes is explained by Level 1 and Level 2 covariates, and an ICC of .10. A more conservative assumption that 50% and 25% of the variance in Level 1 and 2 outcomes are explained by Level 1 and 2 covariates, respectively, and an ICC of .20 results in an MDES of 0.296. Baseline equivalence testing—QEDs, RCTs with high attrition, cluster RCTs with potential bias from entering individuals.

Section VII: Analysis Plan

Baseline data collected prior to start of intervention:

Yes

Description of baseline data:

state math achievement score, grade 8 (or grade 7 if there was no state testing in grade 8); eligibility for free and reduced price lunch

Covariates you plan to include in the model:

English Language Learner Status, Free and Reduced Lunch Status, Gender, Grade, Race, Special Education Status, Student Pretest

Covariates you plan to include in the model:

Aggregate of Baseline Scores, Aggregate of Individual Characteristics

Analytic model:

-

Plan to handle cases with missing outcome data:

Delete all cases with missing data on any outcome measure

Comments:

1. Analytic model is provided in attachment in Section 8: Additional Materials
 2. Description of confirmatory analyses is provided in attachment in Section 8: Additional Materials
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Section VIII: Additional Information

Links:

No links have been added yet.

Files:

File Name: [Early29 Impact Model.docx](#)

Description: Statistical model for estimating impacts of code.org

File Name: [Early29 Logic model.JPG](#)

Description: Logic model for Equity in code.org initiative

Comments:

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