

REDEE CENTER

QED Evaluation of PLTW in Texas

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4 Research Questions

1. For high school students who do not attend college the year following high school graduation, are there salary differences between PLTW and matched non-PLTW students?
2. Are there differences in post-secondary STEM majoring between PLTW and matched non-PLTW students?
3. Are there differences in post-secondary graduation rates for PLTW and matched non-PLTW students?
4. Once students complete a post-secondary degree, are there salary differences between PLTW and matched non-PLTW students?

P-20W Data Warehouse

- Statewide secondary student enrollment between fall 2012 and spring 2022
- Students linked to teachers in particular classes
- Student demographics and test scores on statewide assessments
- HS graduation
- College enrollment, major, & graduation (Texas and NSC)
 - 2- and 4-year institutions
- Unemployment insurance quarterly wage data
 - Employed based on any income, not full- vs. part-time status
 - No job type data, only industry of employer
 - Only Texas data

Student Groups

- Biomedical and Engineering – courses uniquely identified
 - Non-PLTW were listed as generic courses
- *PLTW* students – took only *PLTW* courses
- *Non-PLTW* students – took only non-*PLTW* courses
- Students who took both types were excluded

Propensity Score Matching

- Sample selected
- PLTW students matched 1:1 with non-PLTW students
- PSM
- Baseline Equivalency assessed using Hedge's g
- Inferential statistical model

Inferential Statistics

- Logistic regression for dichotomous outcomes (Yes/No)
- OLS regression for continuous outcomes (Wages)
- PSM and regression IVs include:
 - School year, Alg1 score, Biology score, English II score, gender, ethnicity, EcoDis, EB, Special Ed, Grade, course count, campus locale
 - Treatment variable in regression

Outcomes of Interest

- Post-HS graduation Employment and Wages
- College enrollment & STEM Majors
- Bachelor degree
- Post-bachelor wages

Biomedical Basics

- 45% took 1 PLTW course
- 55% took 2+ PLTW courses
- 18% took all four PLTW courses (~17,000 students)

In 2021-22

- *Principles of Biomedical Science* – 41% of enrollment
- *Human Body Systems* – 28%
- *Medical Interventions* – 19%
- *Biomedical Innovation* – 12%

Biomedical Outcomes

- HS Graduation
 - PLTW = non-PLTW ($n = 21,474$)
- Employed
 - Year 1: PLTW < non-PLTW ($n = 5,298$; OR = 0.88)
 - Year 2: PLTW < non-PLTW ($n = 3,068$; OR = 0.80)
- Income (wages > \$0)
 - Year 1: PLTW = non-PLTW ($n = 3,100$; coeff = \$257, $p = 0.072$)
 - Year 2: PLTW = non-PLTW ($n = 1,690$)

Biomedical Outcomes

- College Enrollment
 - Year 1: PLTW > non-PLTW ($n = 12,510$; OR = 1.49)
 - Year 2: PLTW > non-PLTW ($n = 3,421$; OR = 1.47)
- STEM Major
 - PLTW > non-PLTW ($n = 12,872$; OR = 1.32)
- College Graduation
 - PLTW > non-PLTW ($n = 1,372$; OR = 1.32)
- Post-College Wages
 - Year 1: PLTW = non-PLTW ($n = 1,930$)
 - Year 2: PLTW = non-PLTW ($n = 1,930$)

Engineering Basics

- 70% took 1 PLTW course
- 30% took 2+ PLTW courses

In 2021-22

- *Introduction to Engineering Design* – 59% of enrollment
- *Engineering Design & Development* – 11%
- *Civil Engineering & Architecture* – 11%
- *Aerospace Engineering* – 9%

Engineering Outcomes

- HS Graduation
 - PLTW > Non-PLTW ($n = 76,318$; OR = 1.07)
- Employed
 - Year 1: PLTW = Non-PLTW ($n = 26,324$)
 - Year 2: PLTW = Non-PLTW ($n = 18,732$)
- Income
 - Year 1: PLTW > Non-PLTW ($n = 16,108$, \$148)
 - Year 2: PLTW > Non-PLTW ($n = 10,862$, \$202)

Engineering Outcomes

- College Enrollment
 - Year 1: PLTW > Non-PLTW ($n = 50,788$; OR = 1.16)
 - Year 2: PLTW > Non-PLTW ($n = 20,292$; OR = 1.12)
- STEM Major
 - PLTW > Non-PLTW ($n = 40,006$; OR = 1.14)
- College Graduation
 - PLTW ~> Non-PLTW ($n = 10,984$; OR = 1.08)
- Post-College Wages
 - Year 1: PLTW = Non-PLTW ($n = 7,440$)
 - Year 2: PLTW < Non-PLTW ($n = 7,440$; $-\$1,044$, $p = 0.047$)

Q & A

Thank you!!

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