



**CTE** | Career & Technical Education  
RESEARCH NETWORK

# CTE and Dual Enrollment: Evidence from NYC's PTECH High Schools and North Carolina's Career and College Promise

**Winter 2024 Webinar Series: New Evidence  
on the Impacts of Secondary CTE**

**March 5, 2024**

The work of the CTE Research Network Lead is supported by the Institute of Education Sciences at the U.S. Department of Education with funds provided under the *Carl D. Perkins Career and Technical Education Act* through Grant R305N180005 to the American Institutes for Research (AIR). The work of the Network member projects is supported by the Institute. The opinions expressed are those of the authors and do not represent the views of the Institute or the U.S. Department of Education

Source: Next Generation Learning Challenges

# Meet the Presenters



Julie Edmunds  
Early College Research  
Center, SERVE,  
University of North  
Carolina at Greensboro



Rachel Rosen  
Center for Effective CTE,  
MDRC



Kathy Hughes  
American Institutes  
for Research

# CTE Research Network

Goal: To expand the evidence base on CTE by promoting and disseminating causal research

Five-year grant from IES, ED; Led by the American Institutes for Research, Boston College, the Association for CTE, and JFF

Six participating research teams, all conducting causal research in CTE with U.S. Department of Education grants



# Network Studies Underway

- **The Causal Impact of Attending the CT Technical High Schools;** Shaun Dougherty, Boston College; Eric Brunner and Steve Ross, Univ. of CT
- **Assessing the Implementation, Impact, and Variation of CTE Innovation in New York City;** James Kemple, NYU
- **PTECH 9-14 Schools: An Impact, Implementation, and Cost Study;** Rachel Rosen, MDRC
- **The Evaluation of Career and College Promise;** Julie Edmunds, UNC Greensboro; Christine Mulhern, RAND
- **The Impact of Technology-Based Career Advising Tools on High School Students' CTE Choices and Academic Performance;** Rachel Rosen, MDRC
- **An Evaluation of the Efficacy of Virtual Enterprises;** Lindsay Daugherty, RAND Corporation; Kathy Hughes, American Institutes for Research

# Coming Up!

- Causal CTE Research Evidence Review to be released later this year
- 2024 CTE Research Network Convening: Expanding the Evidence Base for Career and Technical Education
  - March 20, 2024 in Crystal City, VA; in conjunction with ACTE's National Policy Seminar
  - Free event with CTE researchers, practitioners, and policymakers
- Register now! [www.acteonline.org/nps](http://www.acteonline.org/nps)

# Announcing the CTE Research Network 2.0!

- Partners: Shaun Dougherty at Boston College, ACTE, and CTEEx (Career and Technical Education Policy Exchange, Georgia Policy Labs, Georgia State)
- Will build on the momentum of the current Network, serving as a hub for CTE research, research training, leadership, and dissemination of research findings
- Will continue to expand the evidence base with high-quality CTE studies, and provide information and evidence to the CTE community about what works, for whom, and why



# P-TECH Grades 9–14 Evaluation: Final Report Findings

**Rachel Rosen** | Director, MDRC Center for Effective CTE

March 5, 2024

# MDRC

A nonprofit, nonpartisan organization, MDRC conducts rigorous studies of programs and policies that affect people with low incomes, actively disseminates the lessons to policymakers and practitioners, and works directly with programs and agencies to help improve their effectiveness.



# First Rigorous Study of P-TECH

- P-TECH has expanded across the US
  - Texas (200+) and New York (50+)
  - 13 additional states
- What is the impact of P-TECH on high school progress, graduation, postsecondary enrollment and degree attainment?
  - Randomized Controlled Trial
  - Sample = 3,161; 2013–2017 9<sup>th</sup> grade cohorts
  - IES funded study, 2017–2023

# The P-TECH 9-14 Schools

## High School

- Accelerated coursework and exam taking
- CTE coursework and soft skills instruction
- College and career advising

## Career Activities and Work-Based Learning

- Industry partnerships
- WBL activities, such as workplace visits, guest speakers, mentoring, and internships

## College Activities

- College partnerships
- Early college (dual enrollment)
- Grades 13 and 14
- Applied AASs

# Implementation Study Findings

- Graduating with the affiliated associate's degree is not the primary goal at most NYC P-TECH 9-14 schools, and is just one of many potential postsecondary options for students.
- NYC P-TECH 9-14 schools maintain a dual focus on college and career, with all study schools providing opportunities for students to engage in college classes and career exploration and work-based learning activities.
- The P-TECH 9-14 model requires substantial coordination and relationship management across high school, employer, and college partners.
- The COVID-19 pandemic interrupted the implementation of the elements of P-TECH 9-14 at all schools. Schools and partners adapted in various ways to provide students career and college opportunities at this time.

# Implementation Study

## Factors that drive variation



Relationships with  
Partners



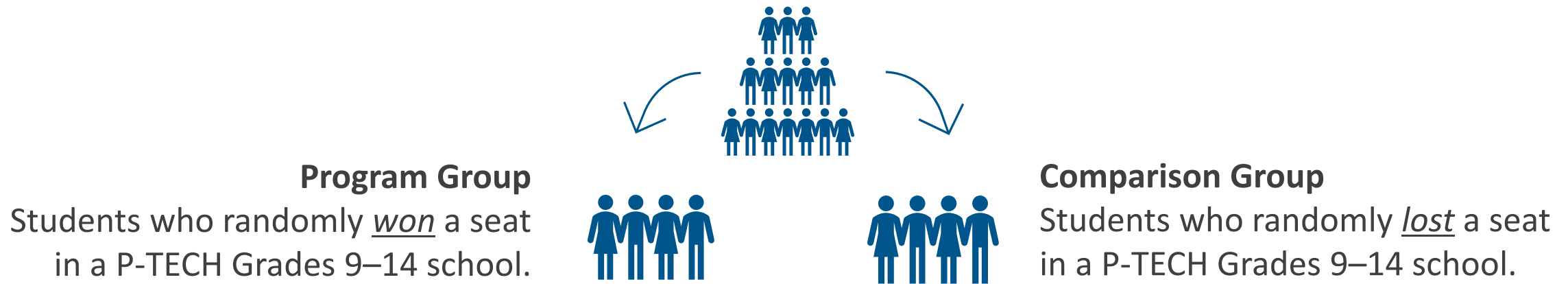
Requirements for  
Participation



Student Interests

# RCT Study Design

Utilizes the NYC admissions lottery to create comparable groups.



Analysis focuses on students who were *offered* a seat

# Comparison Setting

- Comparison setting: 399 other HSs in NYC
- In recent years, there have been concerted efforts to increase NYCPS students' awareness of and access to college and work-based learning opportunities.
- Teachers at P-TECH 9–14 schools reported overall higher school quality and rated their principal's leadership more highly, as compared to teachers in schools of comparison group students.
- Teachers, parents, and students did not report a significant difference in the degree of post-secondary counseling available to P-TECH 9–14 students versus comparison group students.

# Outcomes

## High School Outcomes

Internships

Credits (Academic and CTE)

Dual Enrollment

Graduation

## Postsecondary Outcomes (Years 1–3)

Enrollment/Degrees  
(2 year and 4 year)

Degrees

# High School Lottery

## Data include:

- 9<sup>th</sup> grade cohorts 2013–2017
- Students who were placed in a lottery for P-TECH Grades 9–14 admission

## Important to note:

- 53% of all students offered a seat in P-TECH Grades 9–14 schools are in the analysis sample.



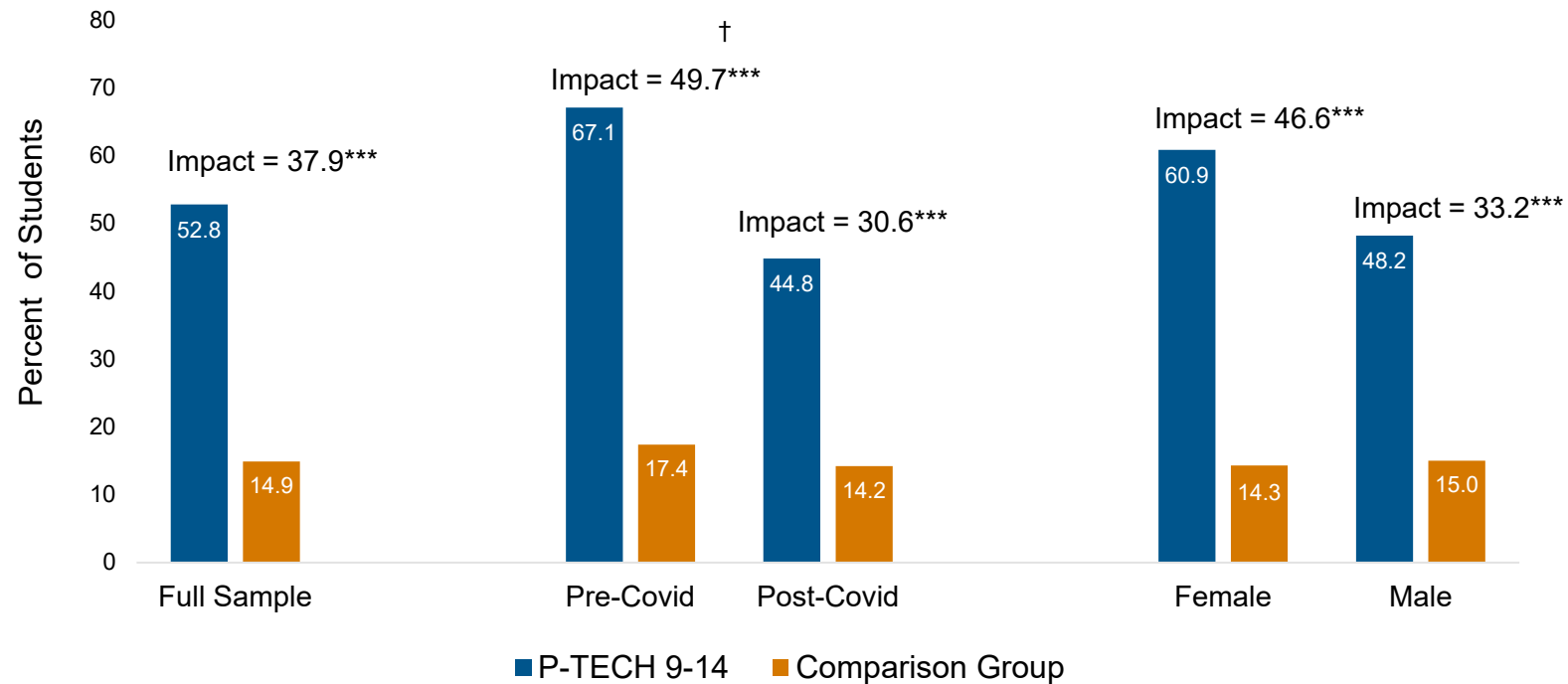
# Who is in the sample?

- P-TECH Grades 9–14 lottery winners are similar to those who did not win entry into P-TECH Grades 9–14 schools, with the exception of a difference in gender.
- Both groups of students are low-performing (levels 1 and 2).

	P-TECH Lottery Winners	Comparison Group Members	Estimated Difference
<b>Characteristic</b>			
<b>Race/ethnicity (%)</b>			
Hispanic	44.8	47.3	-2.6
Black	40.2	39.6	0.6
White	4.7	3.9	0.8
Asian	8.6	7.7	0.9
Other	1.7	1.5	0.2
<b>Female (%)</b>	37.7	42.2	-4.5**
<b>Median household income</b>	-0.5	-0.5	0.0
Missing Median household income (%)	2.6	2.4	0.2
<b>8th-grade ELA test performance level</b>			
Did not meet standards (level 1) (%)	26.1	24.5	1.6
Partially met standards (level 2) (%)	44.8	43.7	1.0
Fully met standards (level 3) (%)	21.6	23.0	-1.4
Met standards with distinction (level 4) (%)	4.1	4.5	-0.4
Missing test information (%)	3.5	4.3	-0.8
<b>8th-grade Math test performance level</b>			
Did not meet standards (level 1) (%)	36.9	36.9	0.1
Partially met standards (level 2) (%)	35.1	35.2	-0.1
Fully met standards (level 3) (%)	11.7	11.7	0.0
Met standards with distinction (level 4) (%)	3.2	4.1	-0.8
Missing test information (%)	13.0	12.2	0.9
<b>Flagged as English Language Learner (%)</b>	10.3	9.9	0.4
Missing English Language Learner (%)	6.6	6.0	0.7
<b>Enrolled in a Charter School Spring of Grade 8 (%)</b>	8.1	8.0	0.2
Sample Size (total=3,161)	1,479	1,682	
Number of lotteries (total=42)			

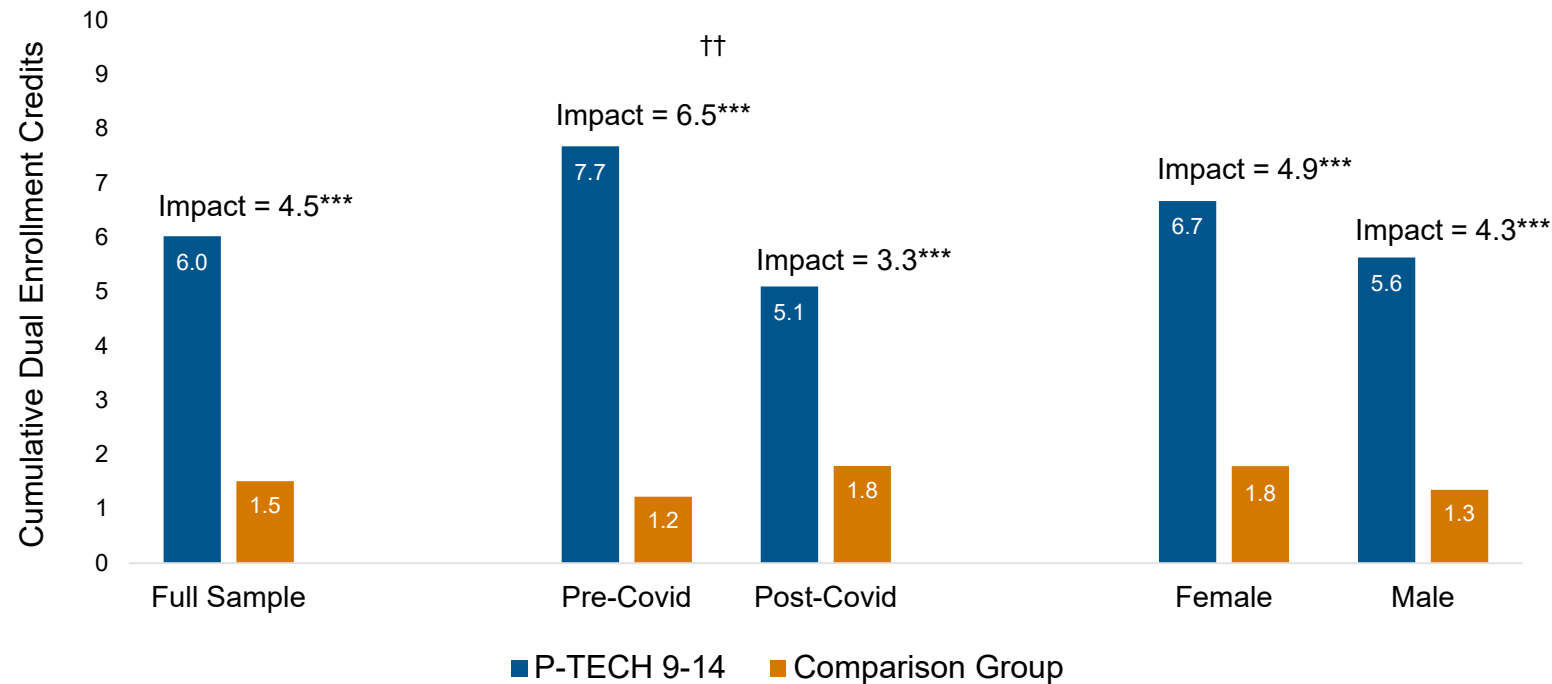
# P-TECH Students Had More Internships

Percent of Students with Any Internship by the End of Year 4



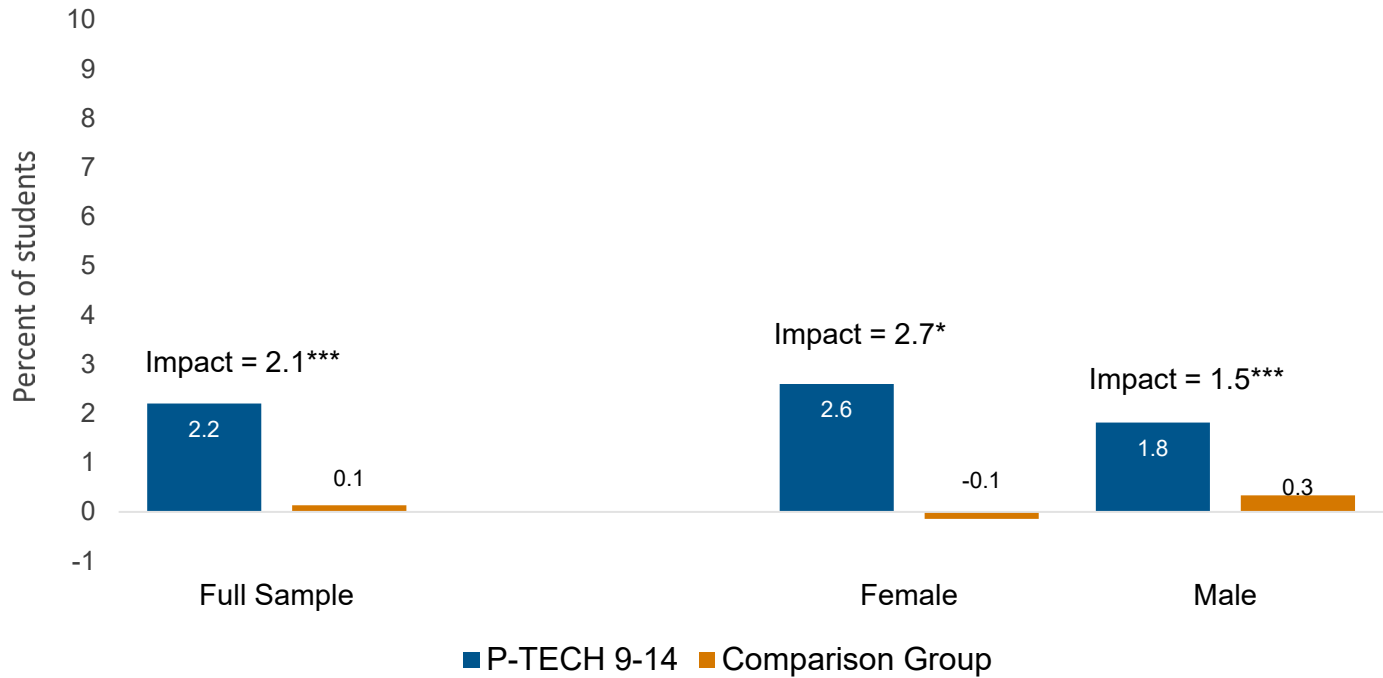
# P-TECH Students Earned More Dual Enrollment Credits

## Cumulative Dual Enrollment Credits Earned Year 4

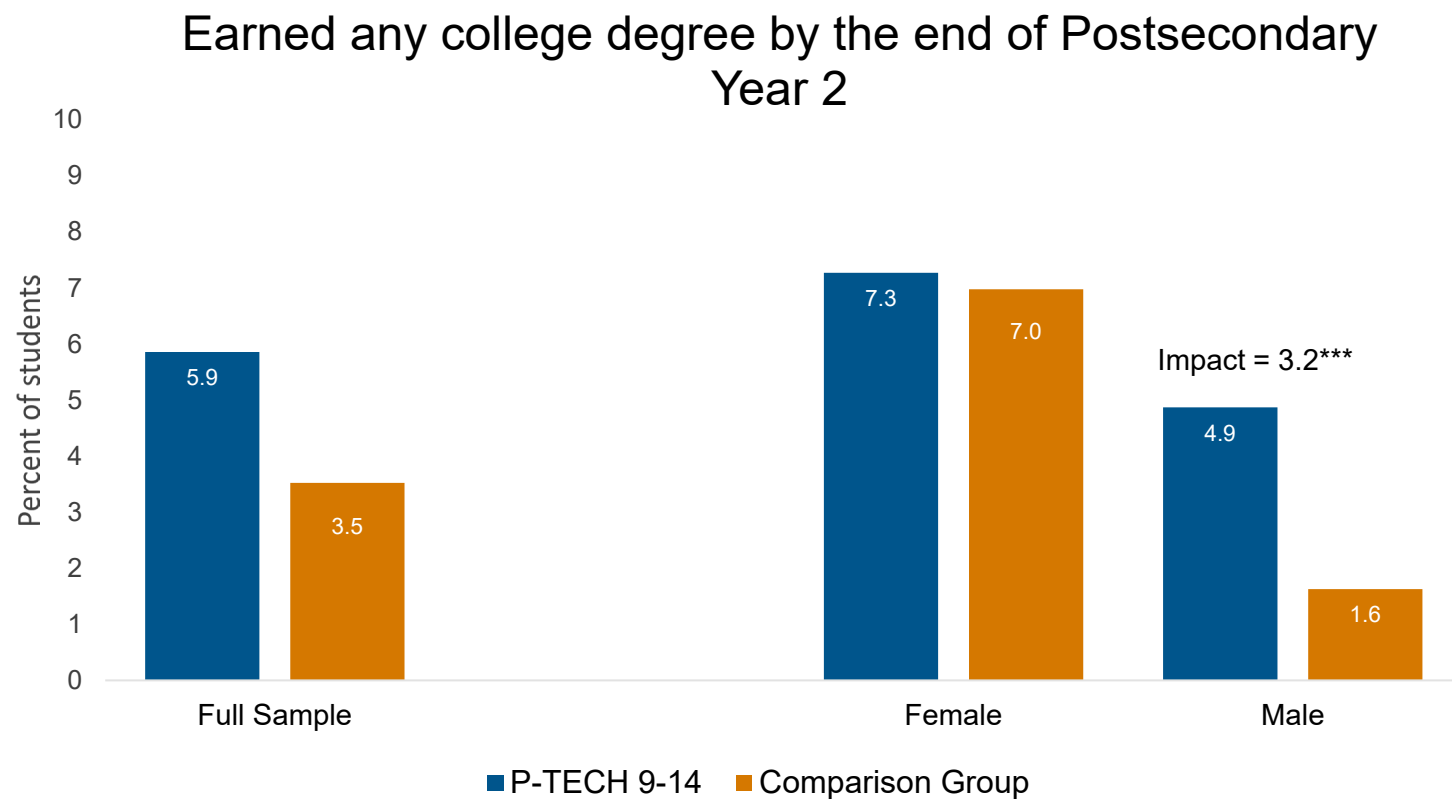


# In Postsecondary Year 1 P-TECH Students Earned More Degrees

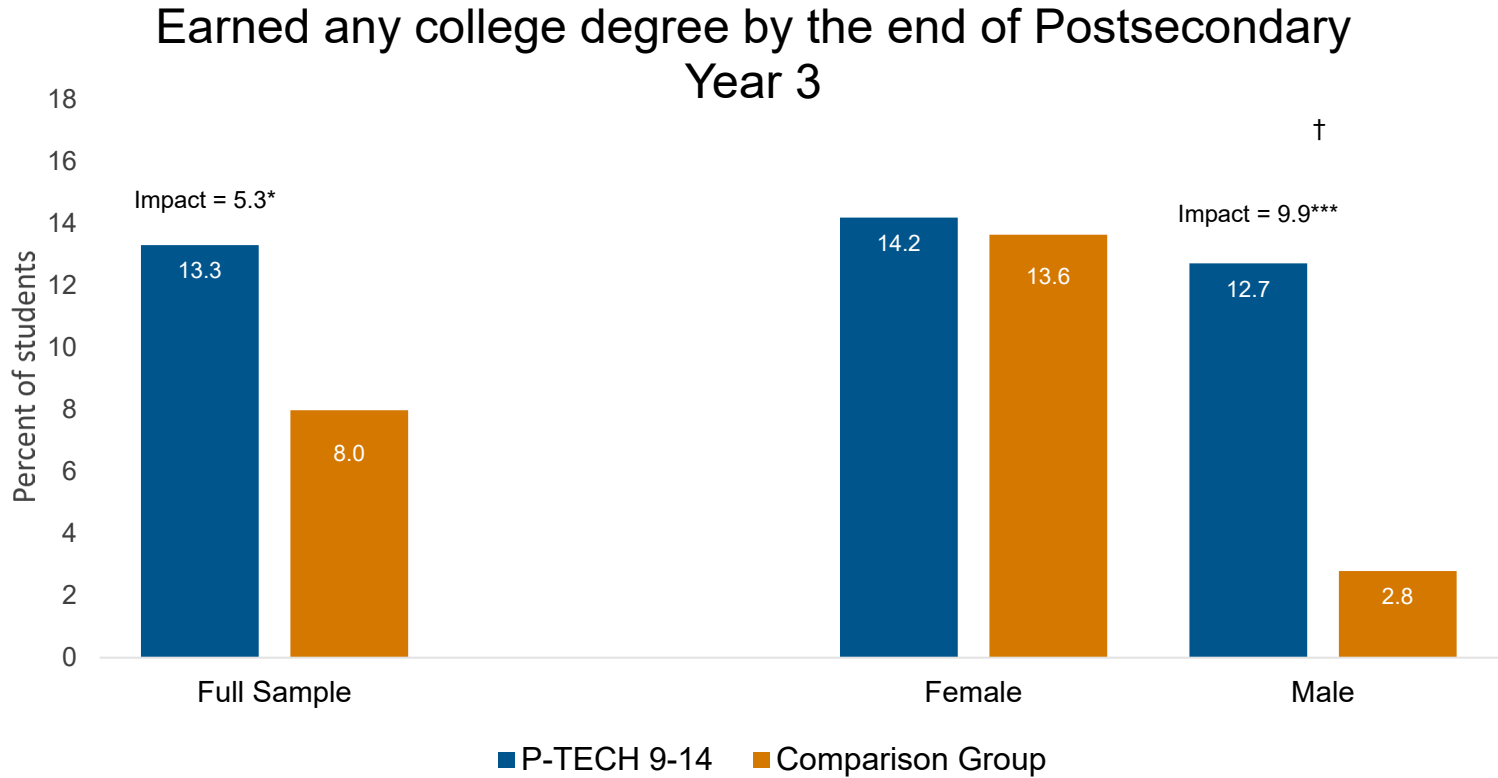
Earned any college degree by the end of Postsecondary Year 1



# In Postsecondary Year 2 Males Earned More Degrees



# In Postsecondary Year 3 P-TECH Students Earned More Degrees, Especially Males



# Cost Study

- **Two cohorts for costs (SY 2014–2015, SY 2015–2016)**
- **Secondary education costs** ~ 17 percent higher per student for the P-TECH 9–14 group compared to the comparison group.
  - CTE-designation
  - Dedicated central office supports
  - Industry partner investments
  - Received secondary education funding for students who continued on the postsecondary degree pathway after their senior year of high school.
- **Postsecondary education costs** were higher for the P-TECH 9–14 group.
  - Dual enrollment and more credits attempted

# Cost Study

**P-TECH 9–14's cost-effectiveness** in college degrees earned varied considerably between the two cohorts. P-TECH 9–14 was cost effective for the SY 2014–2015 cohort, but it was not cost effective for the SY 2015–2016.

- The first cohort utilized more dual enrollment and earned more degrees in the time period than the second
- More follow up is needed to understand P-TECH 9–14's cost effectiveness for other cohorts and if it is cost effective in the long run



# Conclusion

- **P-TECH is supporting more students to earn postsecondary degrees, particularly young men.**
- Important to note that young women are performing equally in both settings.
- Comparison group males are performing less well in other settings.
- P-TECH may be providing supports that help young men make important transitions.

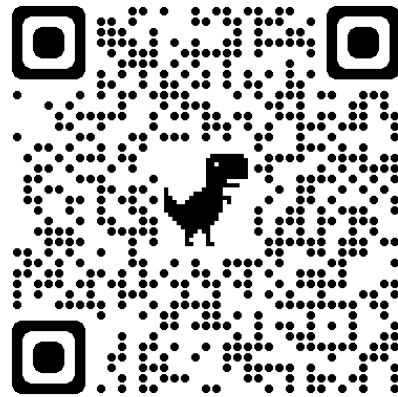
# Questions?



**Rachel Rosen**

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*Visit our project page!*



STUDY OF CTE  
DUAL  
ENROLLMENT

JULIE  
EDMUNDS,  
EARLY  
COLLEGE  
RESEARCH  
CENTER

## KEY POINTS

- CTE Dual Enrollment is a viable pathway to provide students with access to postsecondary courses while in high school.
- Participation in CTE dual enrollment is more equitable than most dual enrollment opportunities.
- Participating in CTE dual enrollment improves student outcomes and increases the likelihood of earning some postsecondary credentials.
  - There is evidence of shifting students from four-year credentials to two-year credentials.

# THIS STUDY IS BROUGHT TO YOU BY THE “EVALUATION OF CAREER AND COLLEGE PROMISE” GRANT

**Five-year study funded by Institute of Education Sciences, U.S. Dept. of Education (Grant #R305H190036)**

**Study Goals: Examine the 1) Impact, 2) Implementation, and 3) Cost of Career and College Promise (CCP). 4) Develop agency partners’ capacity to work with researchers and use data to improve CCP.**

## Partners:



North Carolina Department of  
**PUBLIC INSTRUCTION**

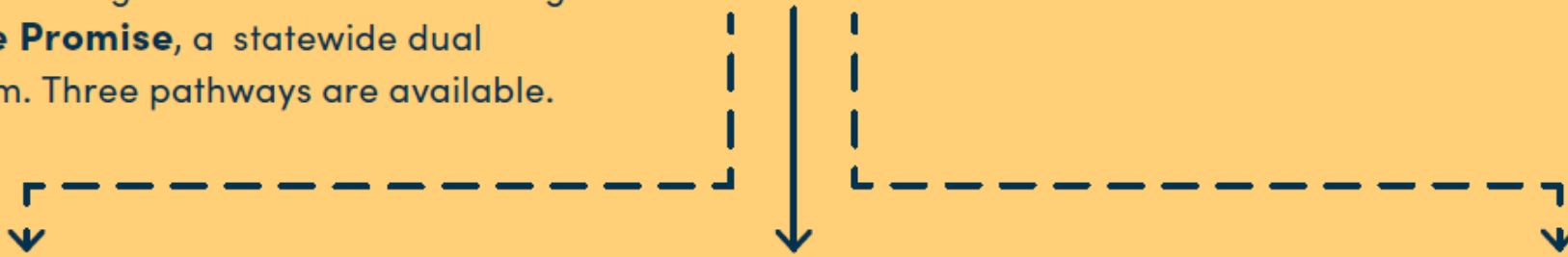


**EARLY COLLEGE  
RESEARCH CENTER**



## North Carolina Career & College Promise Dual Enrollment Program

In North Carolina, eligible high school students can earn credentials and college credits tuition-free from North Carolina colleges and universities through **Career & College Promise**, a statewide dual enrollment program. Three pathways are available.



<b>College Transfer pathway</b>
Take dual enrollment classes that lead to an associate degree to meet general education requirements at a 4-year college.

<b>Career and Technical Education pathway</b>
Take dual enrollment classes to earn college credits leading to technical credentials or workforce-based majors.

<b>Cooperative Innovative High Schools pathway</b>
Earn an associate degree or 2 years of college credit at an approved high school partnered with a college or university (e.g., an early college).

# THE CTE DUAL ENROLLMENT PATHWAY

- Provides tuition-free community college courses that lead to diploma, certificate or workforce-based major.
- Within the overall CTE pathway are more directed programs of study that differ by community college.
- Majority of students enroll as juniors and seniors
  - Some programs of study may include courses that transfer to a four-year.
  - Eligibility includes recommendation and academic readiness (although recommendation can replace readiness score)
- Freshmen and sophomores can participate in a select set of curriculum programs of study (engineering, industrial technologies, agricultural and natural resources, transportation, construction, and business).
  - Eligibility includes recommendations and academic readiness

# SAMPLE CTE PROGRAM OF STUDY (WAKE TECH)

## PROGRAM PLANNING GUIDE

### BIOPHARMACEUTICAL TECHNOLOGY C20180CH: Career & College Promise

Replaces Curriculum Schedule with Revision Date: FA2022

Date Revised: FA2023

#### CURRICULUM BY SEMESTER

Course No.	Course Title	Pre-Requisites	Co-Requisites	Hours Per Week		Credits	Semesters Offered	
				Class	Lab			
Fall Semester								
BPM	110	Bioprocess Practices	None	None	3	4	5	FA
PTC	110	Industrial Environment	None	None	3	0	3	FA
ISC	278	cGMP Quality Systems	None	None	2	0	2	FA
Spring Semester								
ISC	280	Validation Fundamentals	None	None	1	2	2	SP
PTC	120	Pharmaceutical Quality Control	PTC 110	None	3	2	4	

Graduation Requirement Credit Hours: 16



# SAMPLE CTE PROGRAM OF STUDY (WAKE TECH)

2023FA C45840HS



## CAREER AND TECHNICAL EDUCATION

### Nurse Aide Certificate (C45840HS)

Course Number and Title	Prerequisite	HOURS PER WEEK			Credit
		Class	Lab	Clinical	
MED-121, Medical Terminology I	-	3	0	0	3
MED-122, Medical Terminology II	MED-121	3	0	0	3
NAS-101, Nursing Assistant I**	-	3	4	3	6
NAS-102, Nursing Assistant II**	NAS-101	3	2	6	6
<b>Total Graduation Requirement:</b>		<b>18 Semester Credit Hours</b>			

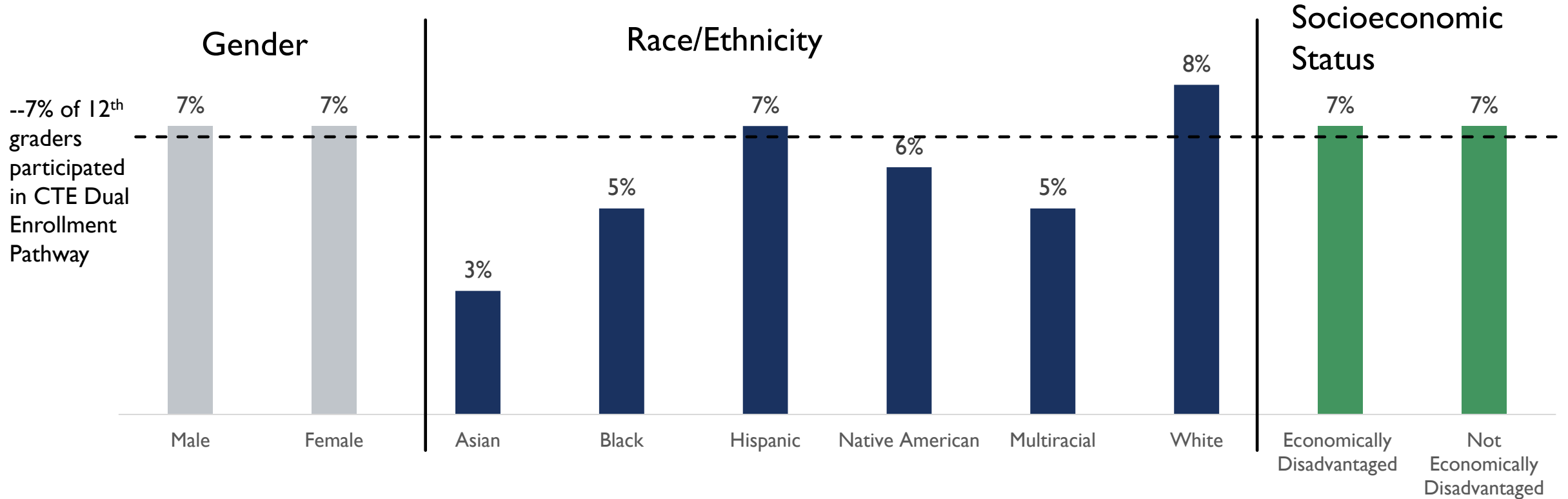
\*Nursing Aide program for Career & College Promise (CTE)



# PARTICIPATION

PARTICIPATION IN CTE  
DUAL ENROLLMENT  
PATHWAY IS GENERALLY  
MORE EQUITABLE THAN  
OTHER PATHWAYS.

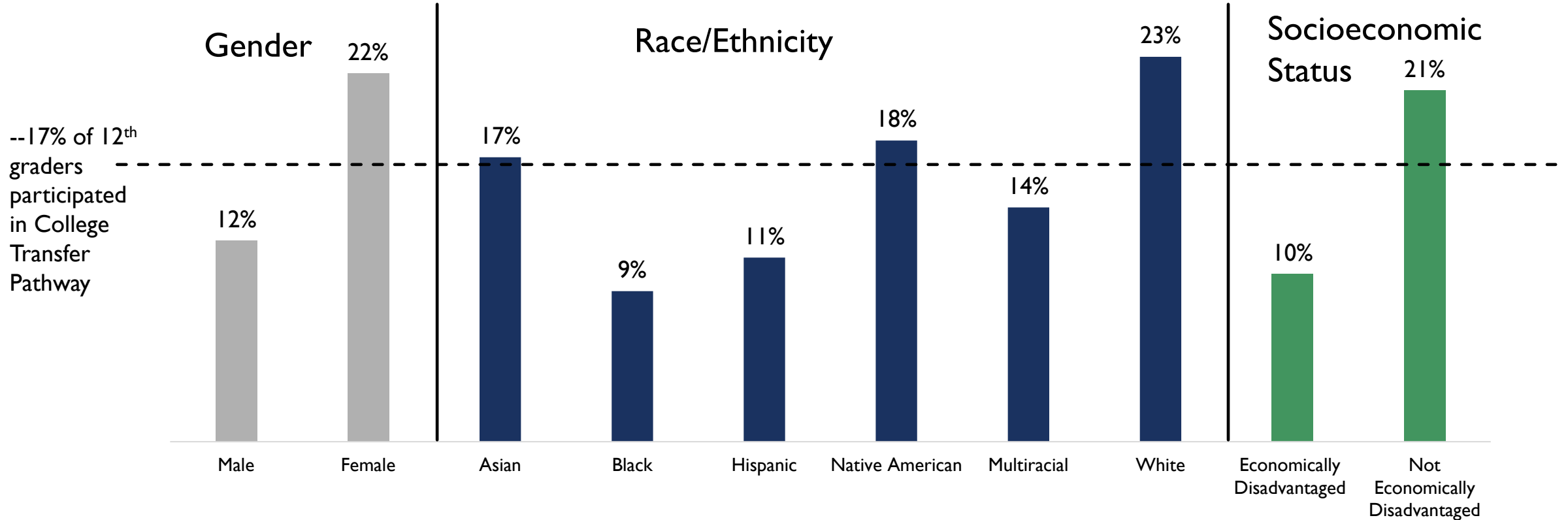
## Participation in CTE Dual Enrollment Pathway—12<sup>th</sup> graders in 2019-20



### Key Takeaways

- Good representation regarding males/females and socio-economic status. White students participate at a rate 1.6 times higher than Black students. Asian students participate at the lowest rate.

# Compare to Participation in College Transfer Pathway—12<sup>th</sup> graders in 2019-20

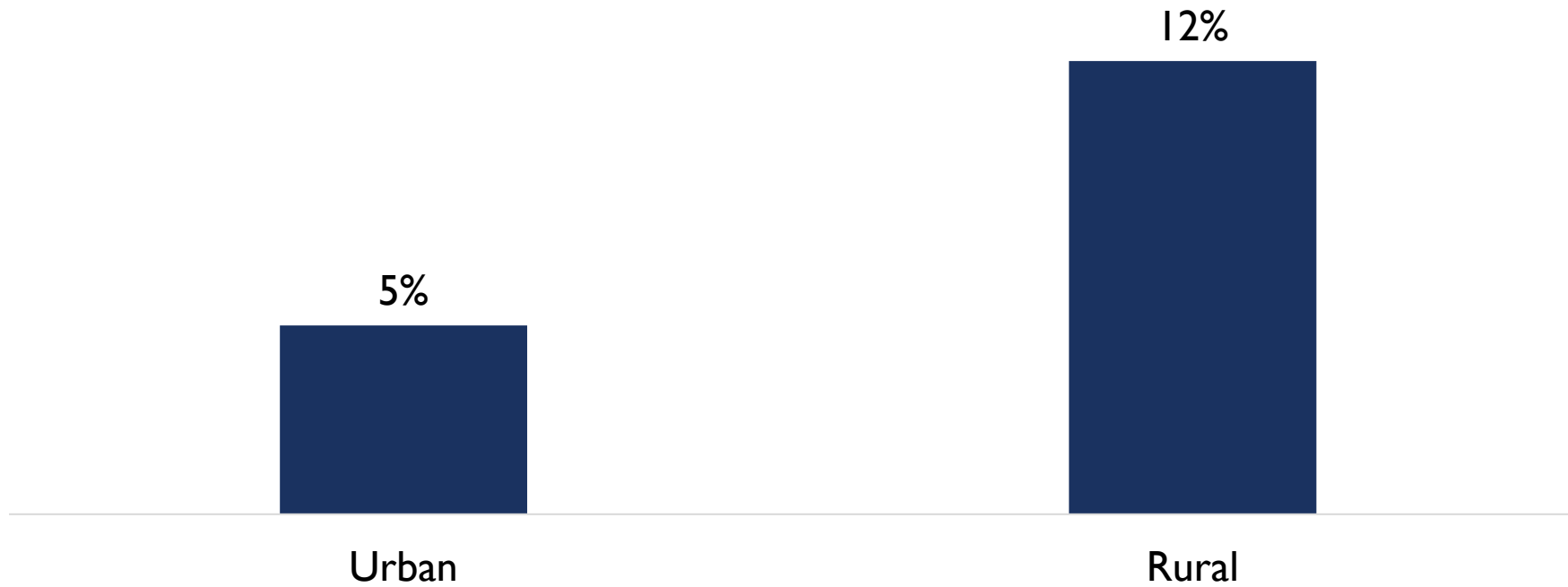


## Key Takeaways

- Gaps in this pathway are the largest with females participating at twice the rate as males; non-EDS students were participating at twice the rate as EDS students. White students participated at a rate 2.5 times higher than Black students.

# RURAL SCHOOLS HAVE HIGHER PARTICIPATION RATES THAN URBAN SCHOOLS

Percentage of 12<sup>th</sup> graders enrolled in CTE, by Locale





WHAT IS THE  
IMPACT OF CTE  
DUAL  
ENROLLMENT  
PATHWAY?

# METHODS

- Compares CTE Dual Enrollment Pathway participants with students not taking any type of dual enrollment pathway
  - Both groups may have taken AP courses
- Sample: 650,000 11<sup>th</sup> and 12<sup>th</sup> graders from 2012–13 through 2020–21
- Comparison group was statistically “weighted,” so they looked more like the treatment group.
- Data sources include: NC Community College System; NC Department of Public Instruction; University of North Carolina System; National Student Clearinghouse
- Caveat: We are using a matching approach, so there may be unmeasured student characteristics that we are not capturing.

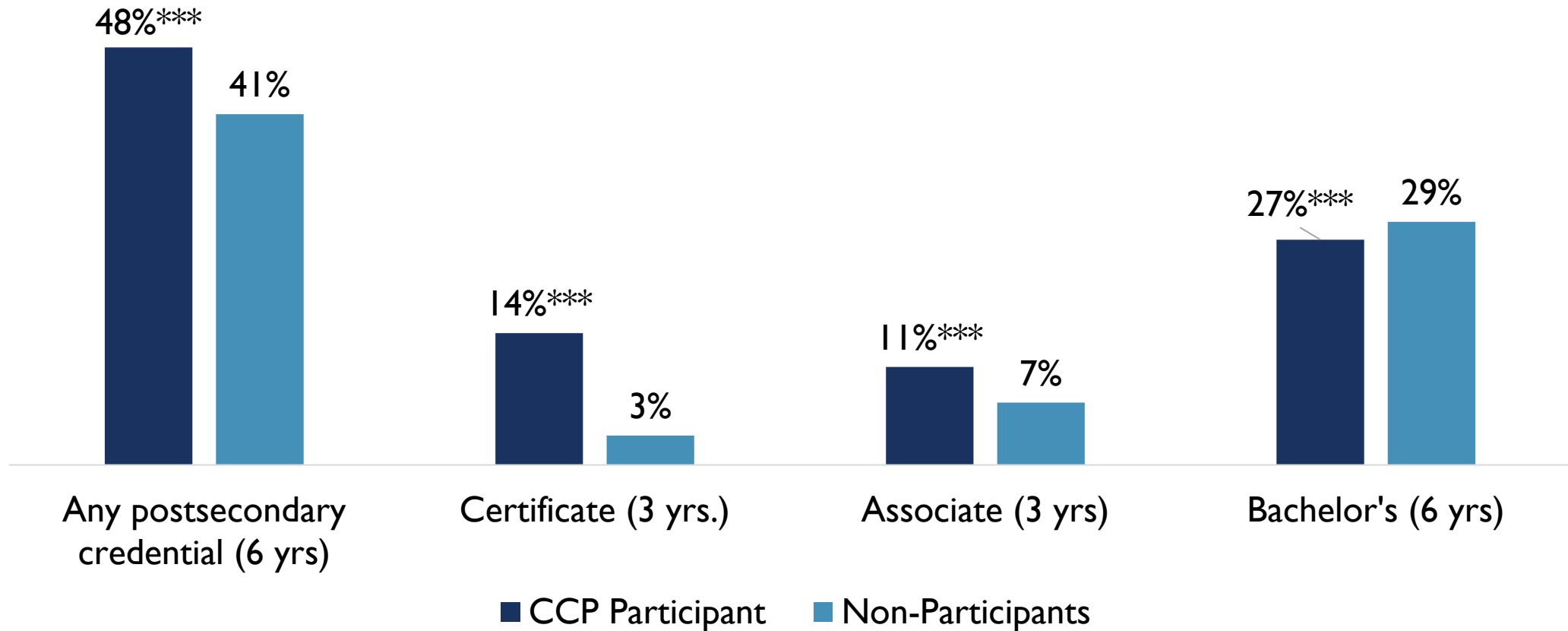
# IMPACT ON HIGH SCHOOL OUTCOMES

Outcome	CTE DE Pathway Participants	Non-participants (Weighted)	Difference
# College Credits earned in High School	10.9	2.0	8.9***
HS GPA (unweighted)	3.04	3.03	0.00
4-year high school graduation rate	98.4%	96.7%	1.7pp***

\*\*\* $p \leq .001$



# CTE PATHWAY PARTICIPANTS WERE MORE LIKELY TO EARN A CREDENTIAL



Note: Credentials could be earned during or after high school.

\*\*\*p≤.001

# IMPACT OF STEM CTE PATHWAY

	Homeland Security Definition Only			Health Sciences Only		
Outcome	CCP Participants Mean	Non-CCP Participants (Weighted) Mean	Impact Estimate	CCP Participants Mean	Non-CCP Participants (Weighted) Mean	Impact Estimate
High school graduation rate	98.8%	97.5%	<b>1.3pp***</b>	99.2%	97.3%	<b>1.9pp***</b>
Unweighted HS GPA	3.13	3.13	<b>.00</b>	3.11	3.10	<b>.01*</b>
Total # of college credits	11.5	3.3	<b>8.2***</b>	9.8	1.5	<b>8.3***</b>
Earning any credential by SIX years after high school	53.3%	45.1%	<b>8.2pp***</b>	53.0%	46.7%	<b>6.3pp***</b>
Earned certificate or diploma within three years post high school <sup>a</sup>	12.9%	3.4%	<b>9.5pp***</b>	11.3%	3.1%	<b>8.2pp***</b>
Earned associate degree within three years post high school <sup>a</sup>	14.0%	7.5%	<b>6.6pp***</b>	11.0%	7.7%	<b>3.3pp***</b>
Earned Bachelor's degree within six years <sup>a</sup>	32.4%	33.2%	<b>-0.7pp</b>	31.2%	33.7%	<b>-2.5pp**</b>

<sup>a</sup>Credentials could be earned in high school or post high school, \*p≤.05; \*\*p≤.01; \*\*\*p≤.001

# IMPACTS ON SUBGROUPS

- In general, subgroup impacts mirror overall impacts except as below.
- Impact on overall credential attainment was higher for males than females, driven by larger impact on certificates.
- Larger impacts on associate degree attainment for students who are **not** economically disadvantaged and White/Asian students.
- Underrepresented minority students and economically disadvantaged students do not see the same negative impacts on bachelor's degree attainment (null impacts).

## RESOURCES

- Early College Research Center:  
[earlycollegeresearch.uncg.edu](http://earlycollegeresearch.uncg.edu)
- CCP Operating Procedures describes implementation of the CCP pathway:  
[https://www.nccommunitycolleges.edu/sites/default/files/basic-pages/academic-programs/attachments/section14\\_2023sp-final\\_version\\_1-20-23.pdf](https://www.nccommunitycolleges.edu/sites/default/files/basic-pages/academic-programs/attachments/section14_2023sp-final_version_1-20-23.pdf)
- NCDPI Program Description for CTE pathway:  
<https://www.dpi.nc.gov/students-families/enhanced-opportunities/advanced-learning-and-gifted-education/career-and-college-promise/career-and-technical-education-pathway>
- Julie Edmunds—[jedmunds@serve.org](mailto:jedmunds@serve.org)



**MARCH 20, 2024!**

**ACTE National Policy Seminar**

Association for Career  
and Technical Education



March 17-20, 2024  
Arlington, Virginia

**Register now at:** [www.acteonline.org/nps](http://www.acteonline.org/nps)



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