

EXECUTIVE
SUMMARY

P-TECH 9-14 Pathways to Success

Implementation, Impact,
and Cost Findings from the
New York City P-TECH 9-14
Schools Evaluation

Rachel Rosen
Emma Alterman
Louisa Treskon
Leigh Parise
Michelle Dixon
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OVERVIEW

The New York City P-TECH 9-14 schools are an educational model that ties together the secondary, higher education, and workforce systems to improve outcomes across domains. The distinguishing feature of the model is a partnership among a high school, a community college, and one or more employer partners that focuses on preparing students for both college and careers within six years.

P-TECH 9-14 schools collaborate with local colleges to provide students with an opportunity to earn a high school diploma within four years, followed by a cost-free, industry-recognized associate's degree. During the six-year program, employer partners provide students with work-based learning experiences such as internships, mentoring, and job shadowing. This model has proliferated rapidly both nationally and internationally since the first school was opened in Brooklyn, NY in 2010.

This study provides impact, implementation, and cost study findings from the first rigorous evaluation of the model, examining the first seven P-TECH 9-14 schools that opened in New York City. The study follows entering classes of students for seven years after they begin ninth grade, which would carry them through the end of their expected high school graduations and through three years of postsecondary education. The study takes advantage of the random lottery process created by the New York City high school admissions system to identify the model's effects: It compares students who won lotteries to attend P-TECH 9-14 schools (the P-TECH 9-14 group) with students who applied but did not win (the comparison group). It also includes an in-depth implementation study that assesses how schools carried out the model, and a cost-effectiveness study that examines costs per college degree earned for P-TECH 9-14 schools compared with other schools.

Findings

1. The high school, career, and college elements of the P-TECH 9-14 model were implemented at all schools, though there was also variation across the schools in the opportunities they had available and how they implemented specific elements of the model. Graduating with an associate's degree from the affiliated college is just one of many potential postsecondary options that school staff members may advise a student to take.
2. Students in the P-TECH 9-14 group were 38 percentage points more likely to have had an internship during four years of high school than students in the comparison group.
3. After four years of high school, 46 percent of students in the P-TECH 9-14 group had dual enrolled in at least one college-level course, compared with 20 percent of students in the comparison group.
4. Seven years after entering high school, students in the P-TECH 9-14 group were 5 percentage points more likely to have completed an associate's degree. These impacts primarily reflect results among young men: 13 percent of young men in the P-TECH 9-14 group completed an associate's degree, compared with 3 percent of young men in the comparison group.
5. The cost analysis shows that PTECH 9-14 schools can generally be operated with resources that are not significantly different than other high schools in the community. Postsecondary costs were higher for the P-TECH 9-14 group, as would be expected given the model's focus on earning a college degree. The findings about the model's cost-effectiveness in producing postsecondary degrees at six years are inconclusive. Additional cost analyses over longer periods are needed.

ACKNOWLEDGMENTS

This report represents the culmination of more than six years of research conducted by the P-TECH 9-14 study team. It has involved collaboration with multiple partners and engaged stakeholders as well as the support of many additional MDRC staff members, and would not have been possible without them.

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The principals of the seven P-TECH 9-14 schools—Hope Barter, Kristin Cahill, Rashid Davis, Patrice Henry, Sarah Kaplan, April McKoy, and Samona Tait—have been patient with our requests and open to our visits and inquiries. We also thank the schools' staff members for their eagerness to share their experiences with us and willingness to open their doors and welcome us into their schools. Staff members from the schools' industry sponsors also provided us with valuable information, and were generous with their time and support for this work.

The P-TECH 9-14 study is one of the member projects in the Career and Technical Education Research Network, also funded by the federal Institute of Education Sciences, and we have benefited from valuable suggestions from the other researchers in this network.

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The Authors

EXECUTIVE SUMMARY

The first P-TECH 9-14 school opened in Brooklyn, NY, in 2010. A collaboration among New York City Public Schools (NYCPS), the City University of New York (CUNY), and IBM, the school was a six-year high school, allowing students to earn both a high school diploma and a free applied associate's degree in a science, technology, engineering, or math (STEM) field at a partner CUNY campus simultaneously. IBM, the schools' employer partner, provided internships and other work-based learning experiences for students, and the two associate's degrees students could earn were in fields related to the work of IBM. Students who completed degrees were also first in line for entry-level jobs at IBM.

Since the first school opened, New York City has opened a total of nine P-TECH 9-14 schools that enroll students from grade 9 through two years of postsecondary education. All these schools involve a three-way partnership among a high school, a community college, and an employer partner. While each of these schools is somewhat different, the basic elements of the model are the same, where each school has one or more employer partners and offers one or more college degrees at the affiliated community college in fields related to the work of the industry partner, creating a pipeline of talent into specific, high-demand industries. Students participate in career and technical education (CTE), work-based learning opportunities, and college classes (including college classes taken while students are in high school, or *dual-enrollment* courses) during the six-year program. The first seven of these schools have taken part in an evaluation conducted by MDRC and funded by the U.S. Department of Education's Institute of Education Sciences

This evaluation provides the first rigorous evidence about the effects of the P-TECH 9-14 model on student outcomes. The study uses a lottery-based random assignment design that takes advantage of the nature of the New York City high school admissions process, in which students were randomly offered or not offered an opportunity to attend a P-TECH 9-14 school. This analysis makes possible a comparison of outcomes where differences between groups of students can be attributed to the difference in the opportunity to attend the schools rather than to other factors, such as student motivation or other characteristics.

This study has also investigated how P-TECH 9-14 schools implemented the elements of the model, and where implementation varied among schools, and has conducted a cost and cost-effectiveness analysis, which assesses the impacts relative to the cost of obtaining them.

MODEL IMPLEMENTATION

The implementation study found that all P-TECH 9-14 schools do maintain a dual focus on college and career, with all study schools providing opportunities for students to engage in college classes, career exploration, and work-based learning activities. Notably, though,

graduating with the associate's degree offered at the affiliated community college as part of a school's model is not the primary goal at most P-TECH 9-14 schools and is just one of many potential postsecondary options. Only a minority of school leaders felt that it was the mission of the school to have as many students as possible remain to pursue the affiliated degree. Rather, school leaders acknowledged that students have a wide variety of interests, often beyond the school's CTE pathways, and their definitions of success centered on ensuring that all students develop a wide range of skills in order to prepare them for the postsecondary options of their choice.

Additionally, while all schools implement the three main components of the model, not all P-TECH 9-14 students are able to participate in every college and career activity available at each school. Factors that influence variation in students' experiences include schools' relationships with their college and employer partners, requirements for participation in college and career activities, and student interest. The P-TECH 9-14 model requires substantial coordination and relationship management across high school, employer, and college partners. Relationships with employer partners vary based on what the employers are able to provide to the schools and relationships with college partners can vary based on colleges' abilities to meet high school students' needs. Other factors include grade point average requirements to participate in some work-based learning activities, and the screening of students for internship eligibility. Finally, not all students remain interested in the pathways provided by the schools, and may choose not to participate.

Finally, the COVID-19 pandemic affected implementation of the components of the P-TECH 9-14 model as all NYCPS schools moved to a virtual format in March 2020, and continued in a hybrid model during the 2020-2021 school year. Schools noted difficulties with remote learning, including decreased attendance and engagement during virtual classes, and Regents exams were canceled from the spring of 2020 through January 2022.¹ The inability to gather in person also substantially affected the availability of work-based learning opportunities. Schools and partners adapted in various ways to provide students with career and college opportunities during this time.

THE IMPACTS OF THE P-TECH 9-14 MODEL

Previous reports from this study found that students who won lotteries to attend the P-TECH 9-14 schools (the P-TECH 9-14 group) earned more high school credits and more college-level credits through dual enrollment during high school than students who did not win those lotteries (the comparison group). This report presents effects on additional high school outcomes including graduation and internship participation, as well as outcomes related to Years 1 through 3 of postsecondary education.

1. Regents exams are New York State exams in core subjects required to graduate from high school.

As well as the full sample of students, the report presents findings for those students who were enrolled in four years of high school before the educational disruptions caused by the COVID-19 pandemic (the pre-COVID subgroup) and those whose high school careers were disrupted by it in some way (the COVID-affected subgroup). The report also presents findings for male and female students, since an earlier report in this study of the impacts of P-TECH 9-14 on dual enrollment found stronger effects for young women than for young men.²

This report contains the finding that P-TECH 9-14 schools had larger impacts on college degrees earned within three years of high school graduation for young men than for young women. Overall, this study found that by the end of three years of postsecondary education, 13 percent of students in the P-TECH 9-14 group had completed postsecondary degrees, compared with 8 percent of the students in the comparison group, a statistically significant 5 percentage point impact. This overall impact, however, primarily reflects an impact among young men. Seven years after entering high school, 13 percent of male students in the P-TECH 9-14 group and only 3 percent of male students in the comparison group had earned a college degree. In contrast, female students in the P-TECH 9-14 and comparison groups earned college degrees at approximately the same rate. This difference in impacts suggests that the P-TECH 9-14 model seems to have provided an additional level of support for young men that they did not experience in other kinds of high schools, allowing them to succeed at similar rates to young women.

This finding is particularly notable because it suggests that the P-TECH 9-14 model may be helping young men buck national trends in college enrollment and degree attainment that have seen this population achieve less in these areas than young women. Nationally, male students have lagged female students in multiple markers of academic success for decades, particularly in those areas of college enrollment and degree attainment.³ At the same time, these findings add to a body of literature that have found CTE engagement can have positive impacts for young men, including an MDRC evaluation of Career Academies, some recent studies of regional vocational technical high schools in Connecticut, and an early evaluation of a high school internship program.⁴ Moreover, as in this study, most of those other studies

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2. Michelle Dixon and Rachel Rosen, *On Ramp to College: Dual Enrollment Impacts from the Evaluation of New York City's P-TECH 9-14 Schools* (New York: MDRC, 2022).
 3. Dylan Conger, "High School Grades, Admissions Policies, and the Gender Gap in College Enrollment," *Economics of Education Review* 46 (2015): 144–147; Dylan Conger and Mark C. Long, "Why are Men Falling Behind? Gender Gaps in College Performance and Persistence," *Annals of the American Academy of Political and Social Science* 627, 1 (2010): 184–214; Nicole M. Fortin, Philip Oreopoulos, and Shelley Phipps, "Leaving Boys Behind: Gender Disparities in High Academic Achievement," *Journal of Human Resources* 50, 3 (2015): 549–579; Statista Research Service, "Undergraduate Enrollment Numbers in the United States from 1970 to 2030, by Gender" (website: <https://www.statista.com/statistics/236360/undergraduate-enrollment-in-us-by-gender/>, 2021).
 4. James J. Kemple and Cynthia J. Willner, *Career Academies: Long-Term Impacts on Work, Education, and Transitions to Adulthood* (New York: MDRC, 2008); Eric J. Brunner, Shaun M. Dougherty, and Stephen L. Ross, "The Effects of Career and Technical Education: Evidence from the Connecticut Technical High School System," *Review of Economics and Statistics* 105, 4 (2023): 867–882; Brett Theodos, Michael R. Pergamit, Devlin Hanson, Sara Edelstein, and Rebecca Daniels, *Embarking on College and Career: Interim Evaluation of Urban Alliance* (Washington, DC: Urban Institute, 2016), although the positive results mentioned were not found in the longer-term follow-up study of the same program.

did not find impacts for female students, because female students engaged in postsecondary education at similar rates, whether they received CTE or not.

It is important to note that the findings from this report are difficult to compare with those of studies of other postsecondary interventions. Most studies of postsecondary education begin with a sample of students who have chosen to enroll in college and, by definition, do not include those students who never enroll in college. In contrast, this study begins with students in the ninth grade, many of whom will not enroll in college at all in the years that can be measured, after the end of four years of high school, which may make the impacts seem relatively small compared with some other postsecondary interventions. But the samples are not the same and this impact on postsecondary outcomes is therefore still noteworthy.

This study also found that students in the P-TECH 9-14 group participated in internships at much higher rates than students in the comparison group, and were 26 percentage points more likely to participate in dual enrollment than students in the comparison group. There were not significant differences between the two groups in the percentages who graduated high school after four years. Students in the P-TECH 9-14 group who attended high school during the years disrupted by the pandemic were still more likely to participate in internships and dual enrollment than students in the comparison group during those years, but the impacts are even larger for students who attended high school before the pandemic.

The cost study found that secondary education costs (those costs incurred when students were enrolled at high school) were about 17 percent higher per student for the P-TECH 9-14 group than the comparison group. The additional costs were due to P-TECH 9-14 schools' smaller size, city designation as CTE schools (which brings with it extra funding), dedicated support from the school district's central office, and industry partner investments. P-TECH 9-14 schools also received secondary education funding for supporting students who elected to continue along the school's postsecondary degree pathway after their senior year of high school. Postsecondary education costs were also higher for the P-TECH 9-14 group, as would be expected for a model that sought to have students complete both high school and postsecondary degrees within six years.

The cost-effectiveness assessment was inconclusive. The study calculated costs for two entering classes (cohorts) of students in the analytic sample. For the first, the model was cost-effective, meaning the cost per degree earned was less for the P-TECH 9-14 group than the comparison group. In that cohort, the P-TECH 9-14 group participated in dual enrollment more frequently and earned more postsecondary degrees than the comparison group. The model was not cost-effective for the second cohort because students in the P-TECH 9-14 group in that cohort did not participate in dual enrollment as often and earned postsecondary degrees at similar rates to the comparison group. These findings suggest that for the model to be cost-effective, students need to engage in its postsecondary elements.

CONCLUSION AND NEXT STEPS

This report provides evidence that the NYC P-TECH 9-14 schools were effective at supporting students to earn more postsecondary degrees than students in the comparison group, up to three years past expected high school graduation, particularly for young men.

However, a majority of students in the analytic sample were still enrolled in postsecondary education at the end of the study period. A longer research timeline would make it possible to follow students to the end of their postsecondary education. Extending the research in that way would make it possible to obtain a more complete picture of the P-TECH 9-14 model's effects on students' postsecondary success and of the model's longer-term cost-effectiveness or monetary benefits.

EARLIER MDRC PUBLICATIONS ON P-TECH 9-14

On Ramp to College

*Dual Enrollment Impacts from the Evaluation
of New York City's P-TECH 9-14 Schools*

2022. Michelle Dixon, Rachel Rosen

Bridging the School-to-Work Divide

*Interim Implementation and Impact Findings
from New York City's P-TECH 9-14 Schools*

2020. Rachel Rosen, D. Crystal Byndloss, Leigh
Parise, Emma Alterman, Michelle Dixon

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ABOUT MDRC

MDRC, a nonprofit, nonpartisan social and education policy research organization, is committed to finding solutions to some of the most difficult problems facing the nation. We aim to reduce poverty and bolster economic mobility; improve early child development, public education, and pathways from high school to college completion and careers; and reduce inequities in the criminal justice system. Our partners include public agencies and school systems, nonprofit and community-based organizations, private philanthropies, and others who are creating opportunity for individuals, families, and communities.

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