The System-Level Effects of Denver's Portfolio Strategy on Student Academic Outcomes

Study Summary

Parker Baxter, J.D.-M.P.A.*

Parker.Baxter@ucdenver.edu

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01 DENVER PUBLIC SCHOOLS: TRANSFORMATION YIELDS STUDENT PROGRESS

In 2007, Denver Public Schools (DPS), Colorado's largest school district, launched one of the most comprehensive efforts to restructure the delivery of public education in American history. Over the decade that followed, the district implemented a coordinated, system-wide reform strategy that prioritized choice for families, empowerment for educators, and accountability for outcomes.

Specifically, the strategy included:

A transformation into a "portfolio model" of school governance with a focus on school-level autonomy. Today, over half of the 200 public schools in the city are district-authorized charter schools or semi-autonomous innovation schools.

The creation of a common set of performance metrics for all schools.

A unified enrollment and expulsion system for all publicly funded schools.

A student-based funding system allocated by need.

An annual process for intervening in persistently low-performing schools and for creating new schools with internal and external partners. Since 2007, 65 new schools have opened and more than 30 others have been restarted or replaced.

This study provides the first comprehensive, system-level answer to the question of whether Denver's reform strategy led to improved academic outcomes for students in English Language Arts (ELA) and math achievement and high school graduation rates throughout its implementation. The study finds the district's reforms were among the most comprehensive in American history and also among the most effective in size, scale and duration.
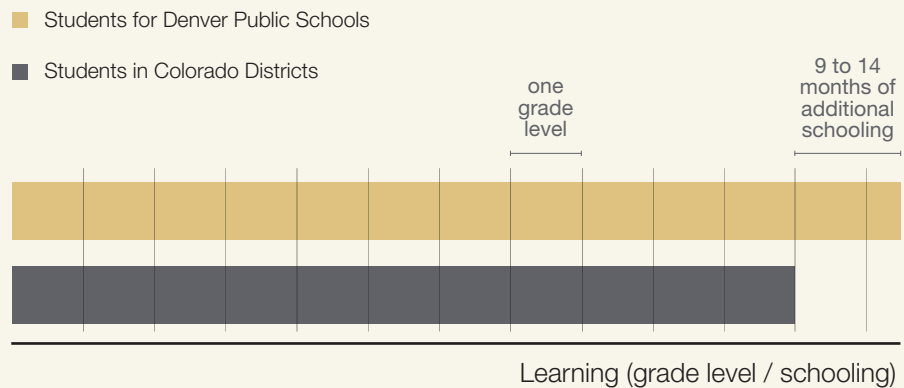
02 FINDINGS: AMONG THE MOST EFFECTIVE REFORM STRATEGIES IN U.S. HISTORY

The study's robust statistical analysis of student outcomes found the following:

The overall effects of **the reforms over 11 years are among the largest ever observed** in educational research.

These findings demonstrate that not only were the district's reforms among the most comprehensive in American history, they were also among **the most effective in size, scale and duration.**

Learning increase for DPS Students

- Students for Denver Public Schools
- Students in Colorado Districts

one grade level

9 to 14 months of additional schooling

Learning (grade level / schooling)

Cumulatively, Denver's reforms translate to at least an additional school-year and as much as an additional year and a half of added learning–an increase of between **1 and 1 ½ grade levels** for DPS students overall.

The study finds that students enrolled in DPS during the 11 years of reforms received the equivalent of at least **9-months and as much as 14-months** of additional schooling than students in comparable Colorado districts.

The study also finds that these reforms increased graduation rates by 14.6 percentage points over the period. The 4-year high school graduation rate increased dramatically during the reform period as well, climbing from 43% in 2008 to 71% in 2019. In the absence of Denver's reforms, instead of reaching 71% by 2019, the graduation rate would have remained below 60 percent.

Graduation Rates High School

Legend:
- Graduation rates High School with "Actual reform"
- Graduation rates High School "without reform" (Estimated)
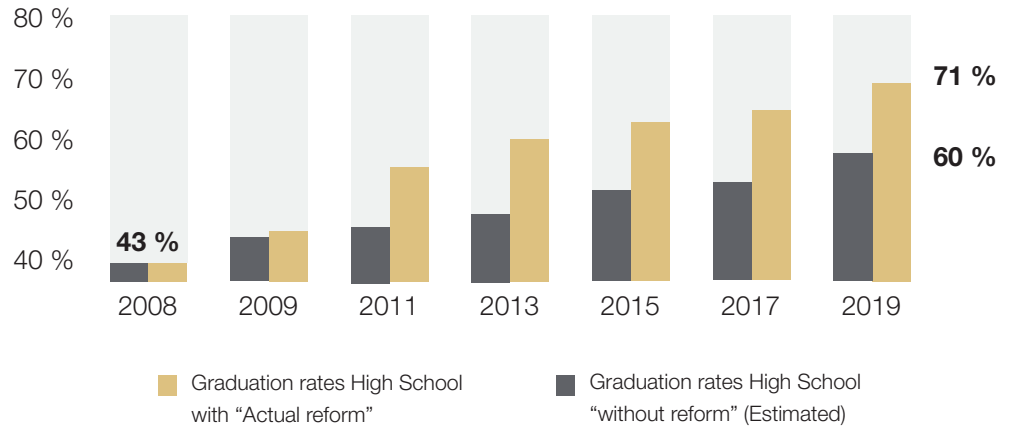
Prior to 2007, DPS was among the bottom 10 districts in the state in ELA and math performance on state standardized assessments, ranking below the 5th percentile of districts.

By 2018-19, DPS had risen to the 60th percentile of districts in ELA and the 63rd percentile of districts in math, out performing more than 100 out of roughly 180 districts in the state.

Performance on state standardized assessments

Legend: ELA, Math
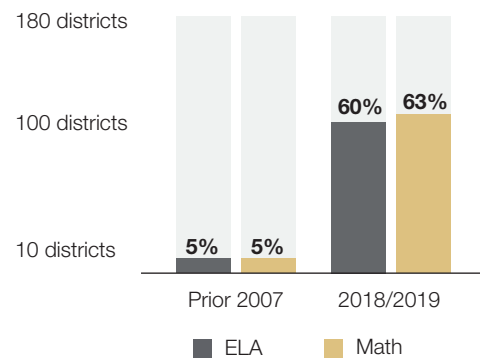
The study also finds positive results for all racial groups and for historically underserved students including low-income students, English Learners, and Special Education students, but these are not generally significant due to limited sample sizes of comparison districts and reduced statistical power. At the system-level, the findings are most reliable precisely where they show the largest improvements.

The study also establishes that the improvements from the reforms are separate from and in addition to improvements due to external factors such as gentrification.

03 EQUITY IN DENVER: FINDINGS FOR BLACK, HISPANIC, LOW-INCOME, ENGLISH LEARNERS AND SPECIAL EDUCATION STUDENTS

Some 3 in 4 DPS students are Black, Hispanic, Asian, Pacific Islander or multiracial. More than 60 percent of DPS students qualified for free- or reduced-price meals during the study period, a widely used proxy for low-income status in education research. More than 30 percent of DPS students are English Learners.

This study finds that Denver's reform strategy significantly improved system-level average student performance, meaning that the effects of the reforms yielded statistically significant improvements across this majority-minority and low-income student population.

Even though DPS serves a student population that is more diverse and has higher needs than other large districts in Colorado, this study finds the district's reforms resulted in Denver students gaining at least an additional year and as much as a year and a half of additional learning compared to their peers in those districts. The study also shows that these improvements were not due to changes in demographics of the district or Denver at-large.

The study finds the effects of DPS reform efforts at the system-level were positive and statistically significant in math for special education students and positive but not statistically significant in ELA and math for English Learners (EL), ELA and math for students qualifying for free- or reduced-price meals (FRL), and ELA for Special Education students.The efforts led to academic improvements for Black students in math and White students in ELA and math. The results were positive but not statistically significant for Black students in ELA and Hispanic students in ELA and math.

The reforms resulted in small to medium system-wide annual effects which accumulated over 11 years of treatment to large effects for ELA, math, and high school graduation for all DPS students.

04 STUDY METHODS

This study utilizes two quasi-experimental research designs commonly used in education policy research and recognized for their validity and precision in establishing the causal impact of policy and program interventions aimed at improving student outcomes: comparative interrupted time series (CITS) and difference-in-differences (DID).

The CITS analyses use district-level data from 2004-05 through 2018-19, which includes four years of pre-reform and 11 years of reform data, to estimate the impact of DPS reform efforts on student performance in English Language Arts (ELA) and math.

A state-level change in the calculation protocols for high school graduation rates reduced the available data for this outcome measure to 2006-07 through 2018-19, necessitating the shift to DID for the associated analyses.

Both of these methods compare the district's performance to a control group of similar districts during both a pre-treatment period and during the reforms to analyze their relative impact over time.
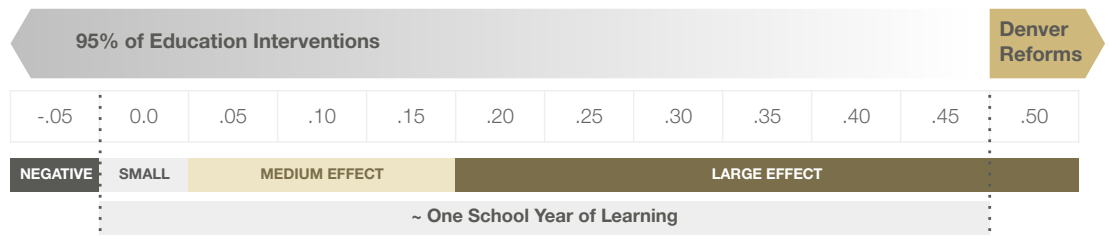
05 SYSTEM-WIDE IMPROVEMENT THROUGH CHOICE, AUTONOMY, AND ACCOUNTABILITY

This study provides the first comprehensive, system-level answer to the question of whether Denver's reform strategy led to improved academic outcomes for students. The results demonstrate that it did.

The study finds the district's reforms were among the most comprehensive in American history and also among the most effective in size, scale and duration.

These findings are important because system-wide improvement in student outcomes of this size and duration is rare under any conditions, and especially so in large school systems with high levels of student need.

												Denver Reforms
95% of Education Interventions												

-.05	0.0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50

NEGATIVE	SMALL	MEDIUM EFFECT		LARGE EFFECT				
~ One School Year of Learning								

Adapted from Kraft (2020) "Interpreting Effect Sizes of Education Interventions."