



# Factors that Impact PreK-12 Student Test Scores in Illinois

An Analysis of 543 Local  
Public School Districts

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## Executive Summary

More than two million children attend over 3,800 public schools in 852 local school districts across Illinois. Nearly all of these districts have collective bargaining agreements (CBAs), privately negotiated contracts between the districts and teachers' unions that determine the terms and conditions of employment.

**An analysis of 543 collective bargaining agreements across Illinois— nearly two-thirds of all PreK-12 school district CBAs— provides an understanding of Illinois' large and dynamic public education system.**

- Illinois has a regressive school funding system, with property taxes accounting for 63 percent of revenue.
- Although school districts receive \$18 billion per year from local property taxes, the average district has just 77 percent of the necessary funding and only 14 percent have annual budget surpluses.
- The average district's spending on instruction is \$6,725 per student.

**There is a large and growing teacher shortage, with nearly 2,900 unfilled education jobs in Illinois.**

- Fully 85 percent of school districts report that the teacher shortage is a "major" or "minor" problem.
- Each year, 13 percent of Illinois teachers either leave their schools or exit the profession altogether.
- Teacher attendance— the share of teachers with fewer than 10 absences— is just 72 percent on average.
- Relatively low pay has caused the shortage, with teachers earning 16 percent less than similar workers.
- Illinois' \$40,000 minimum salary will boost earnings for nearly 10,000 full-time teachers (9 percent).

**An empirical analysis using standardized test scores from the 2017-18 school year reveals that six district-level factors impact the share of students who meet or exceed educational expectations.**

- A 10 percentage-point increase in funding adequacy is associated with a 1 percentage-point improvement in student test score proficiency.
- A 10 percentage-point increase in teacher retention is associated with a 2 percentage-point improvement in student test score proficiency.
- A 10 percentage-point increase in teacher attendance is associated with a 1 percentage-point improvement in student test score proficiency.
- A 10 percentage-point rise in teachers with master's degrees is linked with a 1 percentage-point increase in student test score proficiency.
- A 10 percentage-point increase in low-income students is correlated with a 4 percentage-point decrease in student test score proficiency.
- Student test score proficiency is 2 percentage points lower in consolidated school districts.

**Lawmakers can take steps to retain credentialed teachers and promote children's success in public schools.**

- Raising teacher pay can address the teacher shortage: A 10 percent raise in teacher pay improves the teacher retention rate by 6 percentage points, which in turn improves student academic performance.
- Increasing state funding for education would improve district finances: More than 46,000 students would be prepared for college if all school districts were fully funded.
- Boosting wages can improve student outcomes: While recent policies will make a difference, the state should increase investments in low-income communities to lift children out of poverty.

Illinois' school districts continue to face financial difficulties and teacher shortages that hinder student achievement. Elected officials can take steps to improve the economics of local school districts and attract and retain qualified teachers who effectively prepare Illinois' children for college and the careers of the future.

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## About the Project for Middle Class Renewal

The Project for Middle Class Renewal’s mission is to investigate the working conditions of workers in today’s economy and elevate public discourse on issues affecting workers with research, analysis, and education in order to develop and propose public policies that will reduce poverty, provide forms of representation to all workers, prevent gender, race, and LGBTQ+ discrimination, create more stable forms of employment, and promote middle-class paying jobs.

Each year, the Project will be dedicated to a number of critical research studies and education forums on contemporary public policies and practices impacting labor and workplace issues. The report that follows, along with all other PMCR reports, may be found by clicking on “Project for Middle Class Renewal” at [illinoislabored.org](http://illinoislabored.org).

If you would like to partner with the Labor Education Program in supporting the work of the Project or have questions about the Project please contact Robert Bruno, Director of the Labor Education Program, at (312) 996-2491.



## About the Illinois Economic Policy Institute

Founded in 2013, the Illinois Economic Policy Institute (ILEPI) is a nonprofit organization which uses advanced statistics and the latest forecasting models to empower individuals, policymakers, and lawmakers to make informed choices on questions of public policy. ILEPI provides timely, candid, and dynamic analyses on issues affecting the economies of Illinois and the Midwest.

ILEPI is committed to providing rigorous and methodologically sound analyses that advance high-quality jobs, foster accountable government, and positively contribute to the policy dialogue. To learn more about ILEPI, visit [www.illinoisepi.org](http://www.illinoisepi.org) or call (708) 375-1002.



## Introduction

Public PreK-12 education is a large and complex, yet critically important, system in Illinois. Public education is the primary way to develop children and train young adults for the skills they need as adults to find a good job, live a fulfilling life, and increase economic prosperity. More than two million children attend over 3,800 public schools in Illinois. These schools are distributed across 852 local school districts.

Public schools boost the state's economic competitiveness by training the next generation of highly educated and skilled workers. Historically, the most successful function of government in growing the economy has been to educate the public. On average, an extra year of education increases individual earnings by 7 to 10 percent and boosts economic growth (Stevens & Weale, 2003; Barro, 1997). In addition, a substantial body of research has found a statistical link between school spending and student outcomes (Jackson, 2018). A recent study from researchers at Northwestern University, the University of California, Berkeley, and American University found that a 10 percent increase in spending on public education statistically improves the future wages of students by 7 percent and reduces their chances of living in poverty once they hit adulthood by 4 percent (Jackson et al., 2015). Investments in both public universities and early childhood education programs statistically increase the working-age employment rate, while effective investments in elementary and secondary education reduce unemployment (Bruno & Manzo, 2015; Manzo et al., 2017a).

Research shows that individuals who have access to quality public education are more likely to find gainful employment, have stable families, and be active and productive citizens (College Board, 2017; Craigie et al., 2012). They are also less likely to commit serious crimes and be enrolled in public assistance programs (Bell et al., 2018; Barrett,

1999). Properly investing in PreK-12 public education upfront is more cost-effective for a community than paying for the downstream social and economic consequences of underfunded, low-quality public schools.

This joint study by the Project for Middle Class Renewal (PMCR) at the University of Illinois at Urbana-Champaign and the Illinois Economic Policy Institute (ILEPI) evaluates 543 collective bargaining agreements across Illinois—nearly two-thirds of all school district CBAs—to provide an understanding of Illinois' large public education system and the students that attend Illinois' public PreK-12 school districts. What district-level factors impact student academic performance? This report explores this question.

## Data and Methodology

The Project for Middle Class Renewal (PMCR) at the University of Illinois at Urbana-Champaign and the Illinois Economic Policy Institute (ILEPI) obtained the unique collective bargaining agreements for 543 school districts across Illinois. These complete documents contain the terms and conditions of employment for 86,685 teachers, 66.5 percent of all full-time equivalent public school teachers in Illinois, who collectively educate nearly 1.39 million students, 65.6 percent of all public school students in Illinois (ISBE, 2018a). Information comes from an analysis of the 543 unique collective bargaining agreements—also referred to as CBAs or contracts—as well as from the *Illinois Report Card*, a resource with data compiled and released by the Illinois State Board of Education (ISBE, 2019a). Overall, with a sample size of 543 observations from a total of 852 school districts, the margin of error for this report is  $\pm 2.5$  percent.

This report uses a common but advanced statistical technique called a “regression.” Regressions parse out the independent effect that

a certain variable (such as the teacher retention rate) has on a particular outcome (such as average district-level student test scores), after accounting for other observable factors. These regressions describe “how much” a variable is responsible for the outcome based on a 95 percent level of statistical confidence. A statistically significant result implies that any measured difference is unlikely to be due to chance.

## School District Characteristics and Finances

The 543 school districts evaluated in this report represent all PreK-12 grades. In total, 41 percent were consolidated PreK-12 districts, 4 percent were consolidated K-12 districts, 33 percent were PreK-8 districts, 9 percent were K-8 districts, and 11 percent of school districts were high school districts. The remaining districts were variations of K-5, K-6, Grade 6-12, and Grade 7-12 districts (Figure 1). While the average school district had an enrollment of 2,566 students, the median had 936 pupils.

The State of Illinois has one of the most regressive education funding systems in the country. Due to years of underfunding by state lawmakers, local property taxes are the primary source of revenue for Illinois’ public schools (Manzo et al., 2017b). Across the nation, states provide 46 percent of the funding for public schools and local sources comprise 45 percent of school funding, while the federal government accounts for the remaining 9 percent (Educational Financial Branch, 2015). School funding is skewed towards local sources in Illinois, with local property taxes comprising 63 percent of all elementary and secondary education revenue and the state government only covering 24 percent (Civic Federation, 2017; ISBE, 2018b). Illinois ranks 50<sup>th</sup> in the nation in the percentage of public school revenues coming from the state.

In total, Illinois’ public school districts received nearly \$18 billion from property taxes and other local sources in 2016 (Census, 2018). Due to low state aid, many working-class and middle-class homeowners pay high property taxes to support their schools (Habans & Bruno, 2018). For example, according to Illinois Department of Revenue data, homeowners with taxable earnings

**FIGURE 1: SCHOOL DISTRICT SAMPLE SIZE BY DISTRICT TYPE (GRADES COVERED), 2017-18 SCHOOL YEAR**

District Type: Grades Covered	Number of Districts	Share of Districts
Consolidated: PreK-12	222	40.9%
Consolidated: K-12	24	4.4%
Elementary and Middle: PreK-8	179	33.0%
Elementary and Middle: K-8	49	9.0%
Elementary: K-5 or K-6	3	0.6%
Middle: 6-8	2	0.4%
Middle and Secondary: 6-12 or 7-12	2	0.4%
Secondary: 9-12	62	11.4%
<b>Total</b>	<b>543</b>	<b>100.0%</b>

Source(s): Authors’ analysis of 543 collective bargaining agreements with school districts.

of between \$25,001 and \$50,000 paid 10 percent of their incomes in property taxes on average, while those annual incomes over \$500,000 paid 2 percent or less towards property taxes (Bruno & Manzo, 2019). By relying on a tax that disproportionately affects working-class and middle-class families and low-income renters (as landlords pass on property tax burdens in the form of higher rents), Illinois' education system is particularly regressive. Consequently, recent research has found that low-income districts received 22 percent less in state and local funding than affluent districts in Illinois, or 78 cents on the dollar (Morgan & Amerikaner, 2018). Low-income communities in Illinois are more likely to have underfunded public schools.

To address this systemic problem, Illinois adopted the "evidence-based funding model" in August 2017. Previously, state financial aid to schools was both inadequate and inequitable in distribution. However, under the evidence-based model, each school district is funded based on the district's local financial capacity to meet established spending targets (ISBE, 2018c). The evidence-based funding model invests more money in Illinois' most under-resourced students to enhance student achievement and improve graduation rates (Baker, 2018; Lafortune et al., 2018; Dynarski, 2017).

However, the need for adequate and sustainable funding remains high, with many schools below the "Adequacy Target" required to provide high-quality education (ISBE, 2019a). Of the 543 school districts in the sample, only 78 school districts

have budget surpluses (14 percent) and only 79 have a funding adequacy of over 100 percent, including just 11 districts that are 150 percent funded or better (2 percent), according to the *Illinois Report Card* by the Illinois State Board of Education. By contrast, 121 school districts are less than 60 percent funded and about half (N=268 districts) have between 61 percent and 80 percent of the funding required (Figure 3).

It is important to understand how spending per student is allocated to various school expenditures, such as transportation, teaching staff, and student resources. The most important factor is the investment in instructional activities, which includes only the activities that directly deal with teaching students or the interaction between teachers and students (ISBE, 2018b). A recent study found that every \$1,000 increase in instructional expenditures per pupil is associated with a 1.5 percentage-point increase in the share of students who meet or exceed expectations in English-Language Arts (ELA) and Math scores at all grade levels (Habans & Bruno, 2018). Another study found that increasing per-pupil spending by 10 percent increases the probability of high school graduation by 7 percentage points for all students, and by 10 percentage points for low-income children in particular (Baker, 2018).

The average per-student spending on instruction within the sampled school districts is \$6,725 across Illinois (Figure 4). A total of 36 districts (7 percent) spend \$10,000 or more on instruction per student. These districts are mainly located in affluent suburbs of Chicago.

**FIGURE 2: FINANCIAL CHARACTERISTICS OF SCHOOL DISTRICTS IN THE SAMPLE, 2017-18 SCHOOL YEAR**

Financial Characteristic of School Districts in Sample	District Average	Median District
Funding Adequacy (%)	77.0%	69.0%
Per-Student Spending on Instruction	\$6,724.71	\$6,261.00

Source(s): Authors' analysis of 543 school district collective bargaining agreements and *Illinois Report Card* data (ISBE, 2019a).

**FIGURE 3: BUDGET SURPLUS OR DEFICIT OF SCHOOL DISTRICTS IN THE SAMPLE, 2017-18 SCHOOL YEAR\***

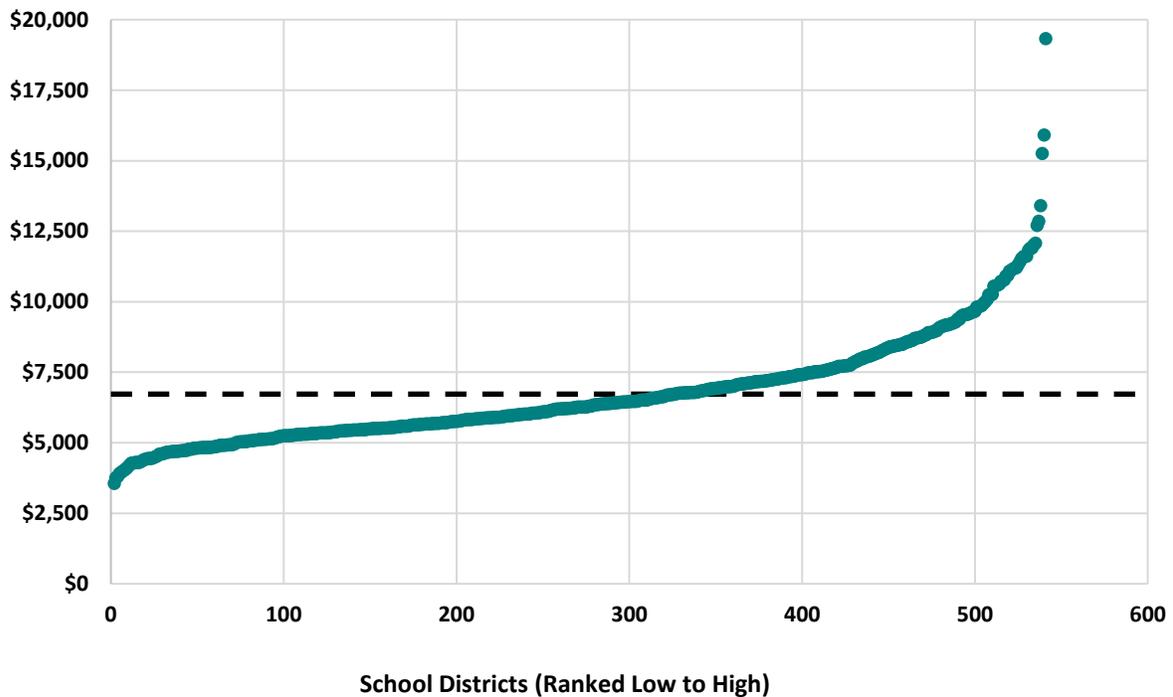
Budget Situation of School Districts in Sample	Number of Districts	Share of Districts
Districts with Surplus	78	14.4%
Districts with Deficit	463	85.4%
Districts Only 50% to 60% Funded	121	22.4%
Districts 61% to 80% Funded	268	49.5%
Districts 81% to 100% Funded	73	13.5%
Districts 101% to 150% Funded	68	12.6%
Districts Over 150% Funded	11	2.0%
<b>Total School Districts*</b>	<b>541</b>	<b>100.0%</b>

Source(s): Authors' analysis of 543 school district collective bargaining agreements and *Illinois Report Card* data (ISBE, 2019a).

\*Financial data was unavailable for two of the 543 school districts in the sample. Chicago Ridge School District No. 127-5 has the lowest school funding adequacy, at 50% funded.

**FIGURE 4: AVERAGE DISTRICT SPENDING ON INSTRUCTION PER STUDENT, SCHOOL DISTRICTS IN THE SAMPLE, 2017-18**

**Per-Student Spending on Instruction by District**



Source(s): Authors' analysis of 543 school district collective bargaining agreements and *Illinois Report Card* data (ISBE, 2019a).

## Illinois' Teacher Shortage and the \$40,000 Minimum Salary

Most public school teachers in Illinois earn incomes in accordance with collectively bargained salary schedules that include base pay and “step” and “lane” incremental payments. “Steps” are determined by the number of years of service as a teacher while the level of educational attainment and professional development defines “lanes.” Fully 94 percent of the collective bargaining agreements at Illinois’ public school districts have steps (N= 491) and 98 percent have lanes (N= 508) or an incremental pay equivalent for academic advancement.

In 2019, Illinois passed House Bill 2078 to gradually increase the minimum salary for public school teachers to \$40,000 per year. The new law, which was signed by Governor J.B. Pritzker in August 2019, increases the minimum salary to \$32,076 in the 2020-21 school year, \$34,576 in 2021-22, and \$37,076 in 2022-23 before reaching \$40,000 (Miller, 2019; WIFR, 2019). In 2018, a previous version of the bill, Senate Bill 2892, was passed by the General Assembly but vetoed by then-Governor Bruce Rauner, who maintained the \$9,000 minimum salary established in July 1980 (Keller, 2018).

Proponents contend that raising the minimum salary will help address Illinois’ teacher shortage. According to the Illinois State Board of Education, there are approximately 2,894 unfilled education jobs in the state (ISBE, 2019b). The teacher shortage— both in Illinois and across the United States— is caused by many factors, including challenging school environments and fewer individuals deciding to join the profession. However, relatively low pay is a significant factor. Across the country, teachers are paid 21 percent less than workers with similar levels of educational

attainment and experience; in Illinois, teachers statistically earn 16 percent less per week (Allegretto & Mishel, 2019).

As a result, school districts are also struggling to retain teachers, with 14 percent of public school teachers either leaving their schools or exiting the profession altogether in the United States. Schools in low-income communities have even higher turnover rates (García & Weiss, 2019). Approximately 85 percent of school districts in Illinois report that they have either a “major” or “minor” problem with teacher shortages but the problem is most acute in central and southern Illinois, where 90 percent of school districts report difficulty in finding qualified teachers (Morgan, 2019).

## Teacher Salaries and Dependability

Using “Educator Employment Information” data from the Illinois State Board of Education for the 2015-16 school year, there were nearly 120,000 full-time public school teachers in Illinois in the 2015-16 school year (Figure 5). Over 58 percent of full-time public elementary, middle, and secondary school teachers in the state have earned master’s degrees. An additional 41 percent of full-time public school teachers have earned bachelor’s degrees. In total, 99 percent of public educators have earned at least a four-year college degree. On average, full-time public school teachers in Illinois earned a salary of \$64,485, but educational attainment is highly correlated with earnings. Teachers with bachelor’s degrees earned an average salary of \$52,060 while those with master’s degrees earned \$72,732 per year on average, about 40 percent more than their counterparts with bachelor’s degrees (Figure 5).

**FIGURE 5: AVERAGE SALARY OF FULL-TIME PUBLIC SCHOOL TEACHERS IN ILLINOIS, BY GROUP, 2015-16**

Full-Time Teachers in Illinois: By Education, Gender, Race, and Grade	Number of Teachers	Share of Teachers	Average Salary
<b>All Full-Time Public School Teachers</b>	<b>119,378</b>	<b>100.0%</b>	<b>\$64,485</b>
Teachers with Bachelor's Degrees	48,626	40.7%	\$52,060
Teachers with Master's Degrees	69,527	58.2%	\$72,732
Teachers with Doctorate Degrees	618	0.5%	\$87,377

Source(s): *Educator Employment Information* from the Illinois State Board of Education for the 2015-16 school year (ISBE, 2018d).

**FIGURE 6: TEACHER PERFORMANCE METRICS, AVERAGE AND RANGE, SCHOOL DISTRICTS IN THE SAMPLE, 2017-18**

Teacher Metrics for Sample School Districts	Average District	Bottom Quartile	Top Quartile
Teacher Retention Rate	87%	84%	91%
Teacher Attendance Rate	72%	64%	80%

Source(s): Authors' analysis of 543 collective bargaining agreements with school districts.

A low teacher retention rate can be costly for school districts, especially in years where there is a shortage of quality teachers. In the 2017-18 school year, teacher retention averaged 87 percent across Illinois. This means that approximately 87 percent of full-time teachers returned to the same school, while 13 percent of teachers either left their positions and went to different schools or left the profession entirely, lower than but statistically similar to the 14 percent national rate (García & Weiss, 2019). One-quarter of Illinois school districts had teacher retention rates of 84 percent or below while the top quartile had teacher retention rates of 91 percent or above (Figure 6).

Teacher attendance— or the percentage of teachers with fewer than 10 absences during the school year— was 72 percent on average in the 543 school districts analyzed (Figure 6). One-quarter of school districts had 64 percent or fewer teachers with 10 absences or less while one-quarter had 80 percent or more teachers with fewer than 10 absences. Attracting and retaining high-quality teachers who consistently show up to work and build strong relationships with their students is

imperative to achieving high-performing school districts.

## Class Size Data

While the evidence on the relationship between class size and student achievement is mixed, there is good reason to believe that smaller class sizes are valuable during the early years of a child's education (Jepsen, 2015; Chingos & Whitehurst, 2011; Thomson-DeVeaux, 2014). When students have more one-on-one time with their teachers, they can ask more questions and receive more attention with fewer distractions in the classroom. While some states have passed legislation to limit class sizes in public schools, Illinois does not have requirements on class size. However, 47 percent of school districts (N= 257) have a class size maximum established in their collective bargaining agreements. Across Illinois, the average class size is 19 students per teacher. About one-quarter of all districts, 24 percent (N= 132), have an average class size of 16 students or less and one-quarter, 27 percent (N= 147), have an average class size of 22 students or more (Figure 7).

**FIGURE 7: STATISTICS ON CLASS SIZE, SCHOOL DISTRICTS IN THE SAMPLE, 2017-18**

Average Class Size of School Districts in Sample	Value or Share of Districts
Districts with Class Size Maximum Policies in CBAs	47.3%
Average Class Size	18.9 Students
Districts with an Average Class Size of 16 or Less	24.3%
Districts with an Average Class Size of 22 or More	27.1%

Source(s): Authors' analysis of 543 school district collective bargaining agreements and *Illinois Report Card* data (ISBE, 2019a).

## Student Characteristics in Illinois

Illinois public school students are diverse in terms of racial background. Out of over two million students, 48 percent are white, 17 percent are African American, 26 percent are Latinx, 5 percent are Asian, and 4 percent are two or more races (ISBE, 2018e). The student body is more racially diverse than the full-time teaching workforce, where 84 percent are white, 6 percent are African American, 6 percent are Latinx, and 1 percent are Asian (Figure 8).

Illinois has a high share of “low-income students,” defined as students in families receiving public assistance, living in substitute care, or eligible to receive free or reduced-priced lunches. For a student to receive a reduced-price lunch, his or her family of three would have to earn below \$38,443 annually in 2018 (ISBE, 2018f). By this metric, 49 percent of Illinois' public school students are considered low-income (ISBE, 2018e). The average low-income student share for the 543 school districts analyzed was 45 percent, while the median low-income student share was 44 percent.

Low-income students tend to have lower test scores than their high-income counterparts. One of the strongest negative influences on test scores is poverty. Lower-income families have fewer educational opportunities in part because their communities tend to have under-resourced schools, which can impede academic progress (Rozen, 2013; Lafortune et al., 2018; Strauss, 2018; Dynarski, 2017). Numerous studies have found that household income affects children's outcomes and that anti-poverty programs, such as food stamps, can improve student performance outcomes (Bastian & Michelmore, 2016; Dahl & Lochner, 2012).

In addition, low-income students are more likely to suffer from “chronic absenteeism,” defined as missing at least 10 percent of the school days within a school year with or without a valid excuse. Students who have many absences are more likely to fall behind in school and may be more likely to drop out before graduation. On average, 13 percent of the students in the 543 public school districts evaluated were chronically absent during the most-recent school year (Figure 8).

**FIGURE 8: STUDENT CHARACTERISTICS AND DEMOGRAPHICS IN ILLINOIS' PREK-12 PUBLIC SCHOOL DISTRICTS, 2017-18**

Student Characteristics	Percent
White	48.0%
African American	16.8%
Latinx	26.2%
Asian	5.1%
Two or More Races	3.5%
Low-Income Students (Per 543 CBAs)	44.5%
Student Chronic Absenteeism (Per 543 CBAs)	12.6%

Source(s): Authors' analysis of 543 school district collective bargaining agreements and *Illinois Report Card* data (ISBE, 2019a) and Illinois State Board of Education's *Illinois State Report Card 2018* (ISBE, 2018e).

## Analysis of District-Level Factors that Impact Student Performance

Numerous factors can impact the academic performance of students, usually measured by standardized test scores. Teacher quality, the quality of the curriculum, school attendance, class size, out-of-school learning experiences, instructional spending, and poverty have all been found to affect test scores (Shavelson et al., 2010; Baker et al., 2018; Habans & Bruno, 2018; Rozen, 2013; Jepsen, 2015).

Standardized testing expanded significantly after the No Child Left Behind (NCLB) Act was signed into law by President George W. Bush in 2002. Under NCLB, states were required to test students on standardized mathematics and reading in grades 3 through 8 and one time in high school (Klein, 2015). In 2009, President Barack Obama expanded standardized test requirements in the “Race to the Top” grant program with Common Core State Standards. A total of 46 states and the District of Columbia initially adopted Common Core by adopting one of the two testing consortia, Partnership for Assessment of Readiness for College and Careers (PARCC) or Smarter Balanced Assessment Consortium. Today, most states have some form of Common Core but have modified their tests (Sanchez & Turner, 2017). Illinois has recently changed its standardized testing. With the adoption of the new Illinois Learning Standards, the state has retired many of its old tests—such as PARCC—and replaced them with new assessments to guide instruction for educators (ISBE, 2019c). Illinois students grade 3 through 8 now take a test called the Illinois Assessment of Readiness (IAR), which is about one-third shorter than PARCC (Thayer, 2019).

However, because PARCC tests were the standard in Illinois, this report uses PARCC Mathematics and English Language Arts (ELA) scores from the 543 school districts. In the 2017-18 school year, the average school district had 37 percent of students

who met or exceeded expectations in the ELA category and 30 percent of students who met or exceeded expectations in the Math category. This meant that about one-third of all Illinois students were “on track for the next grade level and ultimately for college and career readiness” (ISBE, 2019e).

This report uses a common but advanced statistical technique called “regressions” to parse out the independent effect that a certain variable has on a particular outcome, after accounting for other observable factors. These regressions describe “how much” a variable is responsible for the outcome based on a 95 percent level of statistical confidence. The district-level analyses evaluate the impact of each of the following on student test scores: Funding adequacy, teacher retention, teacher attendance, teacher education, enrollment size, the low-income student share, and whether the district is a consolidated PreK-12 or K-12 district. The analysis finds that six factors have statistically significant impacts on student test scores (Figure 9).

First, a 10 percentage-point increase in funding adequacy is statistically associated with a 1.0 percentage-point rise in the share of students who meet or exceed expectations on average (Figure 9). This effect is consistent for both ELA and Math scores. The average district has a funding adequacy of 77 percent. More state funding for PreK-12 education would improve district finances, turning deficits into surpluses and boosting school resources in ways that improve student performance.

Second, a 10 percentage-point increase in the teacher retention rate is statistically associated with a 2.3 percentage-point rise in the share of students who meet or exceed expectations on average (Figure 9). The effect of teacher retention is more pronounced for ELA scores (2.8 percentage points) than for Math scores (1.8 percentage points). The average district has a teacher retention rate of 87 percent. Students do

better when their teachers are retained and have experience with both the district and the local community.

Third, a 10 percentage-point increase in the teacher attendance rate is statistically associated with a 1.3 percentage-point rise in the share of students who meet or exceed expectations on average (Figure 9). Teacher attendance has a slightly higher impact on Math scores (1.4 percentage points) than ELA scores (1.2 percentage points). The average district has a teacher attendance rate of 72 percent, meaning that 72 percent of Illinois teachers have fewer than 10 absences in a year. Student performance is improved when teachers are present and

developing relationships with them in the classroom.

Fourth, a 10 percentage-point increase in the share of teachers with master's degrees is statistically associated with a 0.9 percentage-point rise in the share of students who meet or exceed expectations on average (Figure 9). The educational attainment of teachers has a larger effect on Math scores (1.2 percentage points) than ELA scores (0.7 percentage point). In the average district, 51 percent of teachers have master's degrees or higher. Teacher quality matters; teachers who are highly educated are better trained in the innovative strategies necessary to enhance academic outcomes for students.

**FIGURE 9: REGRESSIONS OF THE IMPACT ON DISTRICT-LEVEL FACTORS ON STANDARDIZED TEST SCORE PROFICIENCY**

Robust OLS Regression Results on Share of Students who Meet or Exceed Expectations: Coefficient (and Standard Error)	Average PARCC Proficiency	ELA PARCC Proficiency	Math PARCC Proficiency
District Funding Adequacy	0.098*** (0.027)	0.099*** (0.027)	0.098*** (0.030)
Teacher Retention Rate	0.233*** (0.065)	0.285*** (0.076)	0.181*** (0.061)
Teacher Attendance Rate	0.130*** (0.032)	0.124*** (0.037)	0.135*** (0.033)
Share of Teachers with Master's Degrees or Higher	0.092*** (0.025)	0.068** (0.030)	0.092*** (0.025)
Share of Students from Low-Income Households	-0.379*** (0.024)	-0.362*** (0.026)	-0.395*** (0.026)
Consolidated Districts	-0.018** (0.008)	-0.016* (0.010)	-0.020** (0.009)
Constant Term	0.093 (0.070)	0.091 (0.081)	0.095 (0.071)
Sample Size	528	528	528
R <sup>2</sup>	0.605	0.521	0.615

Source(s): Authors' analysis of 543 school district collective bargaining agreements and *Illinois Report Card* data (ISBE, 2019a).

\*\*\*P≤|0.01|. \*\*P≤|0.05|. \*P≤|0.10|.

Fifth, the analysis reveals that districts with more low-income students tend to do worse on test scores (Figure 9). A 10 percent rise in the low-income share is associated with a 3.6 to 4.0 percentage-point decrease in the share of students who meet or exceed expectations on average. This finding is particularly relevant because public school districts in Illinois are primarily funded by property taxes and poorer communities have fewer resources to invest in education, negatively affecting test scores and college preparedness.

Finally, consolidated school districts do not do better on student test scores (Figure 9). In fact, the share of total students meeting or exceeding expectations is, on average, 1.8 percentage points lower in consolidated districts. The share of students who are on track for college and career success in Math is statistically 2.0 percentage points lower in consolidated districts. The data also suggests that consolidated districts do 1.6 percentage points worse on ELA scores, but the results are only significant with 90 percent confidence. As elected officials have sought to relieve homeowners from high property tax burdens, one proposal has been to consolidate school districts (Graham, 2019). This finding indicates that elected officials and the voting public should exercise caution and seek to

understand the effects that consolidation could have on student outcomes.

*Economics Matters.* Half of the factors that statistically correlate with the share of students meeting or exceeding expectations on standardized test scores are directly related to local economics and school district finances. The economic conditions of the community play an important role, with districts in more affluent areas doing better on test scores than districts with higher shares of their students coming from low-income families. A district's funding adequacy and the grades it covers also have an impact on student performance, with underfunded and consolidated districts performing poorest (Figure 10). Districts with a funding adequacy of 80 percent or better have significantly higher percentages of students who are on track for college or careers than under-resourced districts. However, of those, consolidated districts have a lower percentage of students who meet or exceed test score expectations, on average (Figure 10).

*Teachers Matter.* Half of the factors that are linked with high-performing districts pertain to teacher quality and teacher dependability. On average, districts that have highly educated teachers who reliably show up to work every day and stay in the district each year tend to have more students who do well on standardized tests.

**FIGURE 10: STANDARDIZED TEST SCORE PROFICIENCY BY FUNDING ADEQUACY AND TYPE OF DISTRICT, 2017-18**

Standardized Test Score Proficiency: Type of District by Funding Adequacy	Number of Districts	Average PARCC ELA Meet or Exceed Share	Average PARCC Math Meet or Exceed Share
<i>Funding Adequacy: 80% or Better</i>			
Elementary and Middle School Districts	92	48%	42%
High School (or Middle thru 12) Districts	19	46%	42%
Consolidated Districts	47	40%	34%
<i>Funding Adequacy: Below 80%</i>			
Elementary and Middle School Districts	140	33%	26%
High School (or Middle thru 12) Districts	45	33%	29%
Consolidated Districts	198	33%	26%

Source(s): Authors' analysis of 543 school district collective bargaining agreements and *Illinois Report Card* data (ISBE, 2019a).

**FIGURE 11: REGRESSIONS OF THE IMPACT ON DISTRICT-LEVEL FACTORS ON TEACHER RETENTION AND ATTENDANCE**

Robust OLS Regression Results on Teacher Retention Rate and Teacher Attendance Rate: Coefficient (and Standard Error)	District Teacher Retention Rate	District Teacher Attendance Rate
Natural Log of Average Salary	0.061*** (0.023)	-0.009 (0.027)
Natural Log of Per-Student Instructional Spending	-0.023 (0.019)	0.008 (0.027)
Average Class Size	-0.005 (0.004)	0.002 (0.008)
Average Class Size <sup>2</sup>	0.000 (0.000)	-0.000 (0.000)
Share of Students from Low-Income Households	-0.092*** (0.016)	-0.139*** (0.024)
Consolidated Districts	-0.006 (0.006)	-0.005 (0.012)
Constant Term	0.489*** (0.149)	0.774*** (0.269)
Sample Size	540	533
R <sup>2</sup>	0.143	0.056

Source(s): Authors' analysis of 543 school district collective bargaining agreements and *Illinois Report Card* data (ISBE, 2019a). \*\*\*P≤|0.01|. \*\*P≤|0.05|. \*P≤|0.10|.

How do districts improve their teacher retention rates and teacher attendance rates? Two district-level analyses evaluate the effect of average teacher pay, average instructional spending per pupil, average class size, the low-income student share, and whether the district is a consolidated PreK-12 or K-12 district of each of the following on teacher dependability. In evaluating both teacher attendance rates and teacher retention rates, the share of students who come from low-income families is a statistically significant factor: The more low-income students there are, the lower the teacher retention rate and the lower the teacher attendance rate. This indicates that local economic conditions also have an effect on teacher quality, which in turn affects student performance on standardized tests, a vicious cycle

in high poverty areas that tend to have the most under-resourced schools (Figure 11).

The only other statistically important factor is teacher pay. A 10 percent hike in the average teacher's salary is statistically associated with a 6.2 percentage point increase in a district's teacher retention rate on average (Figure 11). Instructional spending— after accounting for teacher salaries— and average class size have no discernible impact on teacher retention rates or teacher attendance rates. The type of district also does not appear to explain teacher dependability. The best way for school districts to attract and retain high-quality educators that improve student performance is to offer competitive teacher salaries.

## Policy Recommendation for Illinois

Student educational performance is influenced by a complex ecosystem of interrelated factors, including but not limited to teacher quality and financial resources (Bryk et al., 2010). To promote children's success in public schools, Illinois must retain credentialed teachers by ensuring that teaching remains an attractive career opportunity for college-educated workers, improve funding so students learn in excellent educational environments, and promote economic growth that fights poverty and expands the tax base. These steps have the largest impacts on disadvantaged and low-income students (Goldhaber, 2016).

### 1. Recommendation for Districts: Raise Teacher Pay

Raising teacher pay is a district-level option that addresses Illinois' teacher shortage and improves student test scores. The "[l]ack of sufficient, qualified teachers and staff instability threaten students' ability to learn and reduce teachers' effectiveness, and high turnover consumes economic resources that could be better deployed elsewhere" (García & Weiss, 2019). Moreover, teachers are more likely to quit if they work in districts that pay lower salaries, especially relative to alternative career opportunities (Darling-Hammond et al., 2016). Fully 45 percent of dissatisfied teachers report that they would leave their teaching job "as soon as possible" for a higher-paying alternative (Spiegelman, 2018).

Providing a competitive level of compensation is essential to attracting and retaining qualified teachers. Currently, teachers in Illinois earn 16 percent less than workers with similar levels of educational attainment and experience (Allegretto & Mishel, 2019). Boosting salaries for public school teachers would increase the attractiveness of teaching for college-educated

youth, luring skilled workers away from other professions and incentivizing them to become educators. In addition, research has found that increased pay for teachers can produce a 17 percent to 25 percent reduction in turnover (Clotfelter et al., 2008; Feng & Sass, 2015).

Results from the district-level analysis indicate that a 10 percent pay raise would improve the teacher retention rate by about 6 percent, which in turn would increase the share of students who meet or exceed expectations on standardized test scores by 1 to 2 percent. This corroborates previous research which has found that low teacher retention rates are associated with lower ELA and Math scores, with particularly strong effects in schools with more low-performing student and more African American students (Ronfeldt et al., 2012). Furthermore, another study has found that raising teacher salaries by 10 percent is associated with a 3 to 4 percentage point reduction in the high school dropout rate—an alternative measure of successful student outcomes (Loeb & Page, 2000).

An across-the-board salary increase would have the greatest impact on teacher retention rates. However, Illinois' new \$40,000 minimum salary law is a small step that will help attract and retain young workers. Districts could also target pay increases to improve performance at particular schools. One study found that offering salary incentives to the highest-performing teachers to transfer to and remain in low-achieving schools is a feasible way to fill vacancies (Glazerman et al., 2012).

### 2. Recommendation for the State: Increase State Funding for Education

Increasing state funding for public PreK-12 education would improve school district finances, help stem the growth in property taxes, and boost student performance. While the "evidence-based funding model" invests more money in Illinois'

most under-resourced students, Illinois still needs adequate and sustainable funding. If a progressive income tax is approved by voters in the 2020 election, Illinois should adopt a rate structure that raises revenue and allows the state to pay down debts, meet pension contributions, *and* increase funding for public PreK-12 education (Bruno & Manzo, 2019).

Results from the district-level analysis indicate that a 10 percentage-point increase in funding adequacy would improve the share of students who meet or exceed expectations by 1 percentage point. Because the average district has a funding adequacy of just 77 percent, this finding suggests that an additional 2.3 percent of Illinois' public school students— or more than 46,000 students— would be prepared for college if all school districts were fully funded at 100 percent. More state funding for PreK-12 education would enhance district finances in ways that elevate student performance.

Increasing state funding for higher education is a smart public policy that grows the economy, but it also contributes to better school district performance. As state funding for public universities decreases, tuition costs go up (Mitchell et al., 2017). The recent two-year budget impasse in Illinois demonstrates this point. During the impasse, annual state funding for higher education declined by an inflation-adjusted \$660 million. Students and their families picked up the tab, with tuition rising by 7 percent, causing many students to choose to attend college out of state (Manzo & Bruno, 2017). By increasing funding for public universities and community college, the state could reduce the high cost of higher education. The promise of lower student loan debt from decreased tuition expenditures would encourage more young Illinois residents to attend college to become teachers. Additionally, lower tuition costs for master's degree programs would incentivize the current teaching workforce to go back to school— a worthwhile investment given

that increasing the share of teachers with master's degrees is also linked with better student academic outcomes.

### 3. Across-the-Board Recommendation: Invest in Low-Income Communities

The State of Illinois must enact economic development policies that grow worker wages, reduce inequality, and invest in low-income communities. A leading cause of poor test scores in Illinois is the economic condition of the local community. School districts with higher shares of students from low-income families statistically have fewer students who meet or exceed academic expectations, in part because poorer districts have fewer resources to invest in education and to attract and retain high-quality, reliable educators.

The way to reduce the share of students coming from low-income families is to reduce poverty; the solutions to poverty are active labor market policies and robust economic growth. Accordingly, recent economic trends and state legislation may have a downstream effect of improving student educational outcomes. According to the Illinois Flash Index, a measure of Illinois' economic performance based on tax receipts, the Illinois economy has been growing for 91 consecutive months, from March 2012 through September 2019 (Giertz, 2019). In July 2019, over-the-year employment growth was positive in all 14 metropolitan areas in Illinois for the first time since May 2000 (IDES, 2019). Pro-growth policies passed by the General Assembly in 2019 such as legalizing cannabis, legalizing sports betting, and the \$45 billion "Rebuild Illinois" infrastructure plan will continue to create jobs (Manzo et al., 2018a; Manzo & Bruno, 2019; Bruno & Manzo, 2017; Heller, 2019). Furthermore, the phased-in increases to a \$15 adult minimum wage in Illinois will eventually boost earnings by 9 percent in Illinois, lift over 200,000 low-income residents out of poverty, and reduce food stamp expenditures

by nearly \$87 million (Manzo et al., 2018b). By responsibly growing the economy and improving labor market standards, Illinois can reduce inequality and expand the tax base, which can increase funding for school districts and improve student outcomes.

However, the state should continue to make investments in low-income communities. In urban communities, investments in public transportation, investments in affordable housing, and increases in public sector employment have been found to reduce African American unemployment (Manzo et al., 2017a). In addition, a declining manufacturing industry is associated with rising child poverty in rural America (Schaefer & Mattingly, 2018). If targeted tax incentives to manufacturers and other businesses are proposed, they should be offered— with clear economic outcomes and consistent enforcement provisions— in low-income and rural areas of the state (Craighead, 2017).

or exceed educational expectations. Student test scores are statistically lower in low-income communities— which have fewer resources to invest in education— and in consolidated school districts, indicating that elected officials should exercise caution in the movement to consolidate districts.

Lawmakers can take steps to retain qualified teachers and promote children’s success in public schools. Raising teacher pay can address the teacher shortage, which in turn could improve student academic performance. Boosting state funding for education would improve school district finances and increase the number of students who are prepared for college. Finally, enacting public policies that grow worker wages and lift children out of poverty can improve student educational outcomes.

## Conclusion

Public education is the primary way to develop children and train young adults for the skills they need to succeed. More than two million children attend over 3,800 public schools in 852 local school districts across Illinois.

An analysis of 543 collective bargaining agreements across Illinois provides an understanding of Illinois’ large and dynamic public education system and the students that attend them. An empirical analysis using standardized test scores from the 2017-18 school year reveals that six factors impact the share of students who meet or exceed educational expectations. Increasing a district’s funding adequacy, improving the teacher retention rate, improving the teacher attendance rates, and increasing the share of teachers with master’s degrees are all linked with a higher share of students who meet

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