Exploring the Effectiveness of Solution Tree's PLC at Work® Process in Texas Schools

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Executive Summary

This evaluation examines the impact of the Professional Learning Communities (PLC) at Work® Process on teaching, learning, and workforce stability in Texas public schools. Commissioned by Solution Tree and conducted by researchers at the Center for Innovative Research in Change, Leadership, and Education (CIRCLE) at Texas Tech University, this study focuses on Model PLC at Work® schools. These campuses have demonstrated three consecutive years of student growth and sustained fidelity to the PLC at Work® Process. The core question guiding this research is:

> ***Does sustained implementation of the PLC at Work® Process improve student learning outcomes and teacher retention in Texas public schools?***

The PLC at Work® Process builds educator capacity through structured collaboration within teams that share responsibility for the learning of all students. These teams engage in ongoing, cyclical conversations guided by four critical questions: (1) What do we want students to learn and be able to do? (2) How will we know if students have learned it? (3) How will we respond when students struggle? (4) How will we respond when students are proficient? Teacher teams analyze evidence of learning, plan aligned instruction, and develop targeted interventions and extensions to ensure that each student receives timely and appropriate support. Model PLC at Work® schools provide an ideal context to examine the long-term effects of this work given their proven commitment to collective practice.

Using linked administrative data across all Texas public schools from 2015 to 2023, this evaluation synthesizes findings from three individual reports on academic achievement, student growth, and workforce stability. Our findings indicate that the PLC at Work® Process strengthens both teaching and learning, producing measurable gains in student achievement and contributing to a more stable, experienced, and effective teacher workforce. Model PLC at Work® schools outperform statewide averages in math and reading, show increasing achievement effects over time, and maintain lower teacher turnover rates, particularly among highly effective teachers. These results suggest that investing in sustained professional collaboration can yield enduring benefits for students, educators, and schools across the state.

Key Takeaways

1. **Model PLC at Work® schools outperform state averages across mathematics, reading, and science.**

Descriptive analyses reveal that campuses designated as Model PLC at Work® schools consistently exceed statewide proficiency measures in mathematics, reading, and science compared to similar socioeconomic schools. For mathematics, Model PLC at Work® Schools demonstrate proficiency rates ranging from 73% to 84%, surpassing the state averages by 5 to 8 percentage points. In RLA, proficiency rates are 51% to 69%, exceeding state averages by 4 to 12 percentage points. Similarly, science proficiency rates at Model PLC at Work® Schools are high, with scores between 44% and 55%, outperforming the state averages by 8 to 9 percentage points. These results amplify the stronger academic performance of students in Model PLC at Work® Schools compared to their peers statewide, suggesting that the PLC at Work® process contributes to improved student outcomes across key subject areas.

2. Sustained implementation produces measurable gains in student learning.

Students in Model PLC at Work® schools experience statistically significant gains in learning over time. Findings suggest that students in Model PLC at Work® schools have approximately 3.1 additional months of learning in math and approximately 1.8 additional months of learning in reading in a calendar year as compared to demographically similar non-Model PLC at Work® schools. These effects are statistically significant and consistent across years. These findings highlight that the PLC at Work® process functions as a long-term strategy for improvement rather than a short-term intervention.

3. Achievement gains are strongest for historically underserved students.

Analyses disaggregated by student subgroups indicate that the PLC at Work® process supports more equitable learning outcomes. Economically disadvantaged students and English learners showed the largest improvements in both math and reading, narrowing persistent achievement gaps. The emphasis on timely intervention, frequent monitoring, and shared responsibility ensures that instructional decisions are responsive to individual student needs. These findings demonstrate that collaborative teacher practices can serve as an effective equity strategy, particularly in schools that maintain consistent structures for intervention and enrichment across grade levels.

4. Teacher turnover rates remain substantially lower than statewide averages.

Overall, Model PLC at Work® schools consistently have lower teacher turnover rates than the average Texas public school – approximately seven percentage points lower in recent years. This stability may reflect the strong collaborative culture and shared accountability found in the PLC at Work® process. The findings suggest that schools implementing the PLC at Work® process not only improve student outcomes but also build environments where educators are more likely to remain.

5. PLC at Work® implementation supports the retention of highly effective teachers.

Longitudinal workforce analyses indicate that the PLC at Work® process contributes to selective retention, strengthening the overall quality of the teaching force. Highly effective teachers (those in the top quartile of value-added scores) were more likely to remain in Model PLC at Work® schools after implementation, while turnover among less effective teachers modestly increased. This pattern suggests that collaborative cultures grounded in evidence of student learning help retain strong educators. Over time, these dynamics likely create a more experienced and effective workforce, enhancing both instructional quality and organizational capacity for sustained improvement.

Implications

Taken together, these findings indicate that sustained implementation of the PLC at Work® process supports stronger academic outcomes, improves learning conditions for historically underserved students, and enhances teacher workforce stability. The evidence suggests that ongoing, structured collaboration is a promising and scalable approach for improving student learning and strengthening schools across Texas.

Section 1. Introduction and Background

This section provides an overview of the purpose, context, and scope for the evaluation of the Solution Tree's Professional Learning Communities (PLC) at Work® process in Texas public schools. It briefly describes the landscape that has shaped the adoption of collaborative professional learning models, outlines the core components of the PLC at Work® process, and details the Model PLC at Work® school designation. The section concludes with the rationale for this evaluation, its research objectives, and a high-level overview of the methodological approach used to analyze student and teacher outcomes.

1.1 Section Summary

- Continuous improvement has become central to school reform efforts over the last three decades, particularly as districts seek structures that promote collaboration, instructional coherence, and responsiveness to student needs.
- The PLC at Work® process provides a comprehensive, evidence-based framework for strengthening collective teacher efficacy through shared inquiry, data-driven decision-making, and targeted intervention.
- The Model PLC at Work® school designation offers a reliable indicator of sustained implementation, enabling researchers to examine long-term impacts on student outcomes and teacher workforce stability.
- This evaluation uses statewide administrative data and a quasi-experimental design to assess the impact of the PLC at Work® process on student achievement, student growth, and teacher retention.

1.2 Purpose of the Evaluation

The purpose of this evaluation is to examine the effectiveness of Solution Tree's PLC at Work® process in improving student learning and workforce stability in Texas public schools. Commissioned by Solution Tree and conducted by researchers at the Center for Innovative Research in Change, Leadership, and Education (CIRCLE) at Texas Tech University, this study focuses on schools that have demonstrated sustained fidelity to the PLC at Work® process through the Model PLC at Work® school designation.

Specifically, the evaluation seeks to understand how long-term implementation of the PLC at Work® process influences academic achievement, student growth, teacher retention, and the organizational characteristics of schools that have institutionalized PLC at Work® structures as part of their continuous improvement efforts.

Over the past three decades, policymakers and educators have recognized that sustained school improvement requires more than isolated interventions or short-term accountability systems. At the same time, expectations for student learning have grown. Attention has shifted towards systems of practice that build the capacity of educators to collaborate, analyze data, and continuously improve instruction. As schools strive to meet the diverse academic and social needs of students, especially after the impact of the COVID-19 pandemic, the question has become not only what works to raise achievement, but how schools organize themselves to support learning for every student, every day (DuFour et al., 2024).

This shift reflects a broader understanding that high-functioning schools are defined not by outcomes, but by the processes and professional cultures that make those outcomes possible. Continuous improvement models emphasize shared responsibilities, data-driven decision-making, and the use of aligned systems for monitoring student progress. As such, the PLC at Work® process has been implemented across a growing number of districts across the country as part of a broader state and local effort to improve instructional quality and student outcomes. As campuses move from compliance-oriented accountability systems towards cultures of continuous learning, the PLC at Work® process provides a structure for aligning professional development, data use, and leadership practices.

Prior studies have shown that collaborative professional learning positively affects teacher practice, school culture, and student outcomes. However, quantified effects across a large and diverse sampling of schools using longitudinal, statewide data are lacking in current literature. Much of the existing research has focused on implementation quality or perceptions of collaboration rather than measurable impacts on student performance and workforce stability. To address this gap, our evaluation uses linked administrative data covering all Texas public schools between 2015 and 2023 to examine the characteristics, student outcomes, and teacher retention patterns of Model PLC at Work® schools. This report synthesizes findings from three individual reports to provide a comprehensive picture of how the PLC at Work® Process supports sustained school improvement in Texas.

1.3 The PLC at Work® Process and Model PLC at Work® School Designation

The PLC at Work® process is an evidence-based framework designed to improve student learning through structured, collaborative teamwork among educators. It represents a powerful framework for school improvement by fostering a culture of collaboration, continuous learning, and student-centered decision-making (DuFour et al., 2024). Over the past two decades, the PLC at

Work® process has been implemented across a growing number of districts nationwide as part of a broader effort to strengthen instructional quality, coherence, and equity. As schools transition from compliance-oriented accountability systems to cultures of continuous improvement, the PLC at Work® process provides an organizing structure that aligns professional development, data use, and leadership practices.

Central to the model is a cyclical, data-driven inquiry process through which teachers analyze student evidence, reflect on instructional practice, and implement targeted interventions and extensions. This collaborative structure emphasizes the use of formative and summative assessments to guide instruction, allowing educators to identify learning gaps, monitor progress, and adjust teaching to improve student learning outcomes (Bailey & Jakicic, 2023; Black & Wiliam, 2009; DuFour et al., 2024). The process is anchored in three big ideas: a focus on learning, a collaborative culture, and a results orientation. It is operationalized through four critical questions (DuFour et al., 2024): (1) What do we want students to learn and be able to do? (2) How will we know if students have learned it? (3) How will we respond when students struggle? (4) How will we respond when students are proficient?

These principles ensure that instructional practices are informed by meaningful formative and summative assessments, with educators using data to identify gaps, adjust instruction, and provide targeted interventions to improve student achievement. The process prioritizes shared accountability and shifts the focus from individual teaching efforts to collective ownership of student success. By establishing systems for timely intervention, enrichment, and progress monitoring, the PLC at Work® process differs from traditional school improvement efforts that focus primarily on compliance. Instead, it builds educator capacity and supports the development of healthy school cultures grounded in collaboration and continuous improvement.

The Model PLC at Work® School designation recognizes campuses that exemplify high-fidelity, sustained implementation of the PLC at Work® process and demonstrate measurable improvements in student achievement (Solution Tree, n.d.). Unlike recognition systems based solely on outcomes, this designation honors schools that embed the PLC at Work® process in their organizational practices and have documented three or more consecutive years of academic growth. Importantly, schools apply voluntarily for this distinction rather than being chosen at random, signaling a proactive commitment to the PLC at Work® process rather than passive selection.

To qualify, schools must provide evidence of their collaborative culture, their focus on results, and their systems for monitoring and supporting student learning. A portfolio is submitted that includes evidence for each, along with evidence of three years of academic growth, to be reviewed by at least two members of the Model PLC at Work® Evidence for Effectiveness Committee which is composed of leaders from previously designated Model PLC at Work® schools (Solution Tree, n.d.). Designation lasts three years, after which schools must reapply and demonstrate continued growth and fidelity. Schools showing promising implementation but not yet meeting all criteria may receive a Promising Practice designation, signifying progress toward full recognition.

Recognition as a Model PLC at Work® school affirms a school's sustained commitment to the PLC at Work® principles. These campuses serve as exemplars for others, demonstrating how systematic use of evidence, aligned professional learning and collective responsibility can produce meaningful, lasting gains in teaching and learning. Because the designation process verifies both implementation quality and a consistent program timeline, Model PLC at Work® schools provide an ideal context for evaluating the long-term impacts of the PLC at Work® process on student outcomes and teacher retention.

1.4 Rationale for Evaluation

A growing dialogue within the educational research community suggests that recognition alone, whether through awards, labels, or accountability ratings, may not inherently lead to sustained school improvement (Loveless & DiPerna, 2006). Instead, meaningful improvement is more often associated with the underlying school culture, particularly cultures characterized by collective responsibility, shared goals, and continuous learning (Cruz et al., 2020). A "healthy school culture" emphasizes the belief that all students can learn at high levels and that educators must work collaboratively to ensure this outcome. Recognition, when tied to such a culture, serves not as a reward, but as an affirmation of an ongoing, organization-wide commitment to excellence.

The Model PLC at Work® school designation reflects precisely this orientation. Unlike recognition systems that focus solely on outcomes, this designation emphasizes the growth of collaborative structures, aligned instructional systems, and data-driven decision making. This approach is grounded in a strong research base showing that professional learning communities strengthen teacher knowledge and improve instructional practice (DuFour et al., 2024; Gore & Rosser, 2022). Understanding how these systems operate in contexts of sustained, high-fidelity implementation is essential for identifying the mechanisms through which PLCs influence student outcomes and school culture.

However, empirical research documenting the long-term effects of PLC implementation remains limited. Most existing studies focus on perceptions of collaboration, implementation practices, or small case studies rather than quantifying student learning outcomes or teacher workforce patterns across large, diverse samples. Even less research examines large-scale outcomes.

1.5 Research Objectives

This evaluation aims to address this literature gap by exploring the influence of sustained, high-fidelity implementation of the PLC at Work® process on teaching, learning, and workforce stability in Texas public schools. This study addresses these central objectives:

1. Describe the demographic, geographic, and organizational characteristics of Model PLC at Work® schools to better understand the context in which sustained PLC implementation occurs.
2. Examine whether students attending Model PLC at Work® schools demonstrate higher achievement levels and greater academic growth in mathematics and reading compared to similar schools across the state.
3. Analyze overall teacher turnover, mobility, and retention of highly effective teachers in Model PLC at Work® schools relative to statewide patterns.

1.6 Methodology

The findings presented in this report are based on an analysis of administrative data sourced from the University of Houston's Education Research Center (UH-ERC) and supplemented with publicly available national data and Solution Tree school data. The UH-ERC integrates information from the Public Education Information Management System (PEIMS) and the Texas Education Agency (TEA) to offer a detailed view of a student's education in preK-12. Additionally, to explore teacher workforce dynamics, the UH-ERC incorporates data from the State Board of Educator Certification (SBEC) which details teacher certification types and preparation pathways, as well as the Texas Workforce Commission (TWC), which tracks teacher mobility and retention within the labor market. Together, these data sources provide a robust and comprehensive landscape of the Texas education system.

The analysis also incorporates publicly available data from the Model PLC at Work® School Locator (www.allthingsplc.info), which identifies designated schools and the year of designation, and from the National Center for Education Statistics (NCES). NCES supplies district-level and geographic characteristics.

Sample Definition

Model PLC at Work® schools were selected as the implementation group for this study because the designation process requires schools to submit three years of implementation data. Using publicly available data from 2015 - 2023, this resulted in a sample size of 117 schools. These data not only includes student achievement data, but also a portfolio of evidence which includes artifacts and narratives describing how the campus has operationalized the PLC at Work® process, providing both quantitative and qualitative assurance that the model has been implemented with fidelity. As a result, these schools offer a clear and consistent program start window and a strong foundation for evaluating the relationship between sustained professional learning structures and student outcomes.

ESSA Evidence Alignment

The study aligns with requirements for ESSA Level 2 (moderate evidence). The use of longitudinal administrative data, defined implementation timing, and approved comparison groups supports rigorous quasi-experimental analysis of within-school changes over time.

1.7 Empirical Approach

This evaluation uses several different approaches to examine the relationship between sustained implementation of the PLC at Work® process and three key outcomes: (1) student achievement levels, (2) student academic growth, and (3) teacher workforce stability. In addition, we used descriptive statistics to have a broad understanding of the Model PLC at Work® school landscape to provide a foundation for the study. Each will be further described in the following sections of the report with a more detailed methodology included in the appendix.

Analysis 1: Who are Model PLC at Work® schools?

The first stage of the analysis uses descriptive statistics to characterize the population of Model PLC at Work® schools. This includes examining student demographics, geographic distribution and district locale, grade spans and campus types, and baseline academic performance relative to statewide averages. The descriptive comparisons help establish the broader landscape of schools that pursue and achieve Model PLC at Work® school designation.

Analysis 2: How do Model PLC at Work® schools perform academically compared to other Texas schools ?

To assess how Model PLC at Work® schools perform relative to other campuses, the second stage of the analysis examines student achievement across mathematics, reading language arts, and science. We use student proficiency levels on the Texas STAAR assessment, which provide a consistent statewide metric of grade-level mastery. By comparing these proficiency rates to statewide norms and to schools serving similar student populations, this analysis clarifies whether Model PLC at Work® schools begin their PLC journey from higher, comparable, or lower starting points. While these analyses are descriptive rather than causal, they provide an important view of how Model PLC at Work® schools' academic performance aligns with or exceeds broader state patterns.

Analysis 3: Does sustained PLC at Work® process implementation improve student learning over time?

The third component of this evaluation estimates the impact of the PLC at Work® process on student learning growth using a staggered difference-in-differences approach. Because campuses pursue and receive Model PLC at Work® designation at different times in the study period, the analysis leverages this variation to compare outcomes between Model PLC at Work® schools and those that do not have a designation.

Using the Callaway and Sant'Anna (2021) estimator, the analysis calculates cohort-specific and year-specific average treatment effects on the treated for grade-standardized STAAR mathematics and reading scores. Models include student-, teacher-, and school-level covariates, along with school, grade, and year fixed effects, with standard errors clustered at the school level.

Analysis 4: Does sustained PLC at Work® process strengthen teacher retention and workforce stability?

The final stage of the analysis investigates teacher workforce trends before and after implementation of the PLC at Work® process, comparing Model PLC at Work® schools to statewide patterns. We use longitudinal educator employment data from SBEC and TWC, the analysis examines overall turnover, and selective retention patterns of teachers based on effectiveness levels.

Staggered difference-in-differences comparisons are used again to assess whether the PLC at Work® process contributes to greater workforce stability, particularly among highly effective teachers. Highly effective teachers are determined based on value-added measures, with those in the top quartile of statewide effectiveness identified as "highly effective" for the purposes of this study.

Section 2. Descriptive Landscape of Model PLC at Work® Schools

This section provides a descriptive overview of the campuses designated as Model PLC at Work® schools in Texas and the context for the study. It includes geographic distribution, student demographic characteristics, and baseline academic performance prior to the impact analysis present in subsequent sections of the study. By looking at where these schools are located and the students they serve, along with their academic performance compared to the rest of the state, this section provides the foundation necessary for interpreting subsequent findings on student achievement, growth, and teacher workforce findings.

2.1 Section Summary

- Geographic Distribution: Model PLC at Work® schools are concentrated primarily in suburban districts, with limited representation in rural and charter school districts. While Model PLC at Work® Schools are found across the state, the majority are located in eastern and southeastern Texas, particularly in districts with larger student populations and near major metropolitan areas.
- Student Characteristics: Compared to all Texas campuses, Model PLC at Work® schools enroll fewer economically disadvantaged students (48% compared to 64%), fewer Hispanic students (41% compared to 53%), and fewer students identified as at risk of academic failure (41% compared to 53%). However, these schools serve similar proportions of students enrolled in bilingual or ESL programs, including students identified as Limited English Proficiency (LEP) students.
- Program Trends: The demographic profile of Model PLC at Work® schools has shifted over time, with recent cohorts (2022-2024) serving an increasing percentage of Hispanic students and students enrolled in ESL programs.
- Baseline Academic Performance: Students in Model PLC at Work® schools demonstrate higher STAAR proficiency rates across math, reading language arts, and science compared to statewide averages, even when schools are grouped by poverty level.

2.2 Geographic Overview

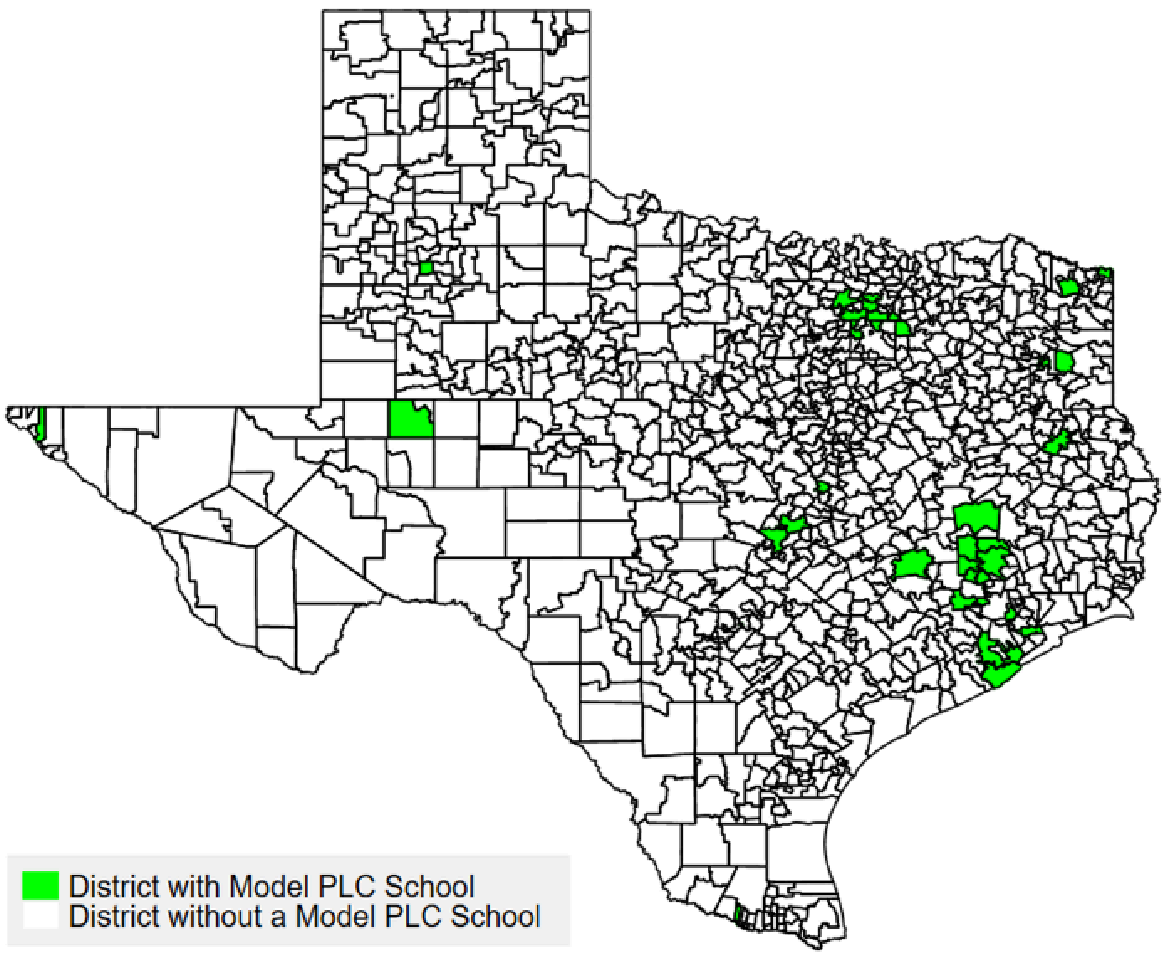
This subsection illustrates the geographic footprint of Model PLC at Work® schools across Texas. Figure 1 illustrates the distribution of Texas districts with at least one Model PLC at Work® school.

The map portrays a clear regional pattern: designated schools are concentrated primarily in the eastern and southeastern regions of the state, near major metropolitan areas such as Houston, Dallas Fort-Worth, Austin and San Antonio. These areas contain larger student populations and more densely clustered school systems, which may facilitate both the adoption and scaling of the PLC at Work® process.

In contrast, representation is far more limited in the western part of the state, where districts tend to be smaller, more rural, and geographically dispersed. This trend aligns with broader demographic and geographic patterns of Texas. Districts in these areas often face additional implementation challenges related to staffing, limited access to professional development, and fewer local resources, which may affect the likelihood of pursuing designation.

Figure 1

Texas School Districts in 2024



Note. Texas school districts in 2024 with at least one Model PLC at Work® designated campus

To further contextualize geographic distribution, Table 1 summarizes the distribution of Model PLC at Work® schools across rural, non-rural, and charter districts. The data highlight a pronounced participation gap. While 11% of non-rural districts have at least one designated school, fewer than 1% of rural districts do, and no charter districts are represented.

Table 1. Distribution of Model PLC at Work® Schools by District Type

District Type	Model PLC at Work® School in District	Districts in Texas	Percentage with a Model PLC at Work® School
Rural	2	679	<1%
Not Rural	36	342	11%
Charter	0	188	0%

This pattern suggests meaningful differences in capacity, access, and structural support across district types. Notably, districts classified as rural, which are those enrolling fewer than 5,000 students, remain significantly underrepresented among designated campuses.

2.3 Demographic Profile

Building on the geographic landscape, this section examines the demographic characteristics of students enrolled in Model PLC at Work® schools at the time of designation. These patterns further contextualize the environments in which the PLC at Work® process is implemented and provide a basis for comparing designated campuses to schools statewide.

To begin, Table A1 provides descriptive statistics for students enrolled in Model PLC at Work® schools, disaggregated by designation year. This table offers a snapshot of each cohort at the time of designation rather than a longitudinal analysis. Even so, reviewing designation-year cohorts over time reveals a shifting demographic profile across the past decade of schools seeking and receiving Model PLC at Work® designation.

Compared to early implementers, campuses designated since 2022 serve a larger percentage of Hispanic students (43% in 2024 compared to 40% in 2015) and substantially more students enrolled in ESL programs (27% in 2024 compared to 15% in 2015). The percentage of students identified as Limited English Proficient (LEP) has similarly increased, rising from 17% among early cohorts to 23% in 2024. These patterns indicate that more recent Model PLC at Work® schools serve increasingly diverse and linguistically varied student populations. At the same time, the percentage of students identified as economically disadvantaged has grown steadily from 45% in 2015 to above 50% for cohorts designated since 2020.

To contextualize these trends, Table 2 compares the aggregate demographic profile of Model PLC at Work® schools (2015–2024) to statewide averages for all Texas campuses. Several key differences are noteworthy. Model PLC at Work® schools enroll lower percentages of Black students (12% vs 16%) and Hispanic students (41% vs 51%) than the statewide averages. They also serve a smaller proportion of economically disadvantaged students (48%) compared to the state average of 64%, and fewer students identified as at risk.

However, Model PLC at Work® schools report similar rates of students enrolled in bilingual programs (36%) and students identified as Limited English Proficient (19%). Representation of students in Special Education is slightly lower (11% vs 12% statewide), while Gifted and Talented participation is marginally higher (7% vs 6%).

Collectively, these demographic patterns show that Model PLC at Work® schools serve diverse student populations but differ in some ways from the statewide landscape. These differences are important to acknowledge because participation in the Model PLC at Work® designation process is voluntary; schools must choose to engage, allocate staff time, and assemble evidence portfolios. As such, the demographic makeup of participating schools likely reflects differences in local capacity, readiness to implement the PLC at Work® process, and district-level priorities related to professional learning and continuous improvement.

Table 2. Demographic Comparison (2015 - 2024)

	Model PLC at Work® Schools	All Schools in Texas
Male	0.51	0.52
Black	0.12	0.16
American Indian	0.11	0.09
Asian	0.08	0.04
Hawaiian	0.00	0.00
Hispanic	0.41	0.51
Limited English Proficiency	0.19	0.19
Enrolled in an ESL Program	0.19	0.20
Enrolled in a Bilingual Program	0.36	0.36
Immigrant Status	0.03	0.02
Migrant Status	0.00	0.00
Economically Disadvantaged	0.48	0.64
Gifted and Talented	0.07	0.06
Special Education	0.11	0.12
504 Indicator	0.06	0.07
At Risk Indicator	0.41	0.53
Observations	117	88528

2.4 Student Performance Snapshot

This section provides a descriptive comparison of student achievement using the State of Texas Assessments of Academic Readiness (STAAR). STAAR is administered annually to measure students' mastery of grade-level expectations in mathematics and reading language arts (RLA) in grades 3-8, with science tested only in grades 5 and 8. For descriptive purposes, we report the percentage of students scoring at the "Meets Grade Level" or "Masters Grade Level" standard, which is collectively referred to as "proficient".

The analysis uses STAAR results from spring 2023, the most recent year available in our dataset. We limit the comparison to Model PLC at Work® schools that have earned this designation prior to March 2023, and compare their proficiency rates to statewide averages for all Texas campuses. Figures 2–4 present subject-specific comparisons for mathematics, RLA, and science.

Across all grades and subjects, Model PLC at Work® schools demonstrate higher proficiency rates than the statewide averages (see Table 3). In mathematics, proficiency ranges from the low 70s to mid-80s across grades 3-8, exceeding state averages by 5 to 8 percentage points. RLA proficiency shows similar patterns, with Model PLC at Work® schools outperforming the state by 4 to 12 percentage points. Science proficiency follows a comparable trend, with designated campuses surpassing statewide rates in each tested grade.

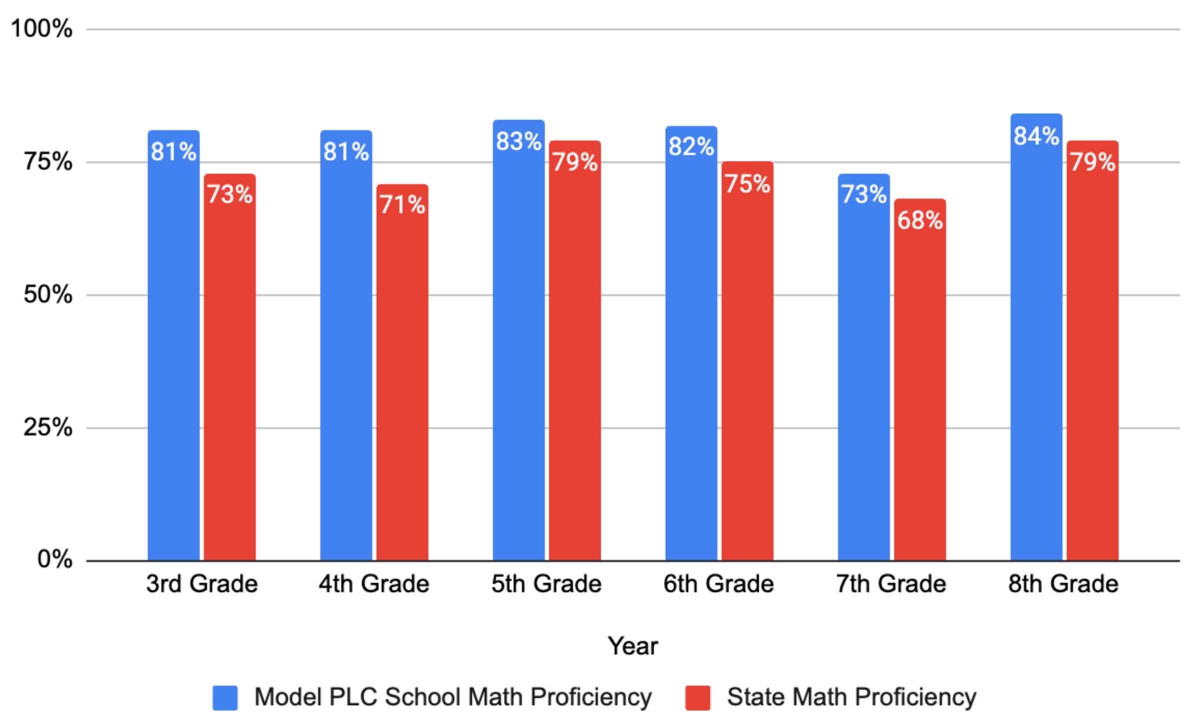
Table 3. 2023 STAAR Proficiency Comparison

Year	Model PLC at Work® School Math Proficiency	State Math Proficiency	Model PLC at Work® School RLA Proficiency	State RLA Proficiency	Model PLC at Work® School Science Proficiency	State Science Proficiency
3rd Grade	81%	73%	63%	51%		
4th Grade	81%	71%	69%	57%		
5th Grade	83%	79%	62%	56%	44%	36%
6th Grade	82%	75%	61%	53%		
7th Grade	73%	68%	51%	47%		
8th Grade	84%	79%	62%	56%	55%	48%

These descriptive differences provide an initial view of baseline academic performance in the year of designation and serve as a foundation for the longitudinal growth analysis presented in Section 3. We present results for each academic area in Figures 2–4. As shown in Figure 2, mathematics proficiency at Model PLC at Work® schools consistently exceeds statewide averages across all grade levels. These gaps range from modest (approximately 5 percentage points) to more substantial (up to 8 percentage points), indicating that designated schools typically have relatively strong academic performance in math.

Figure 2

2023 STAAR Math Proficiency Comparison

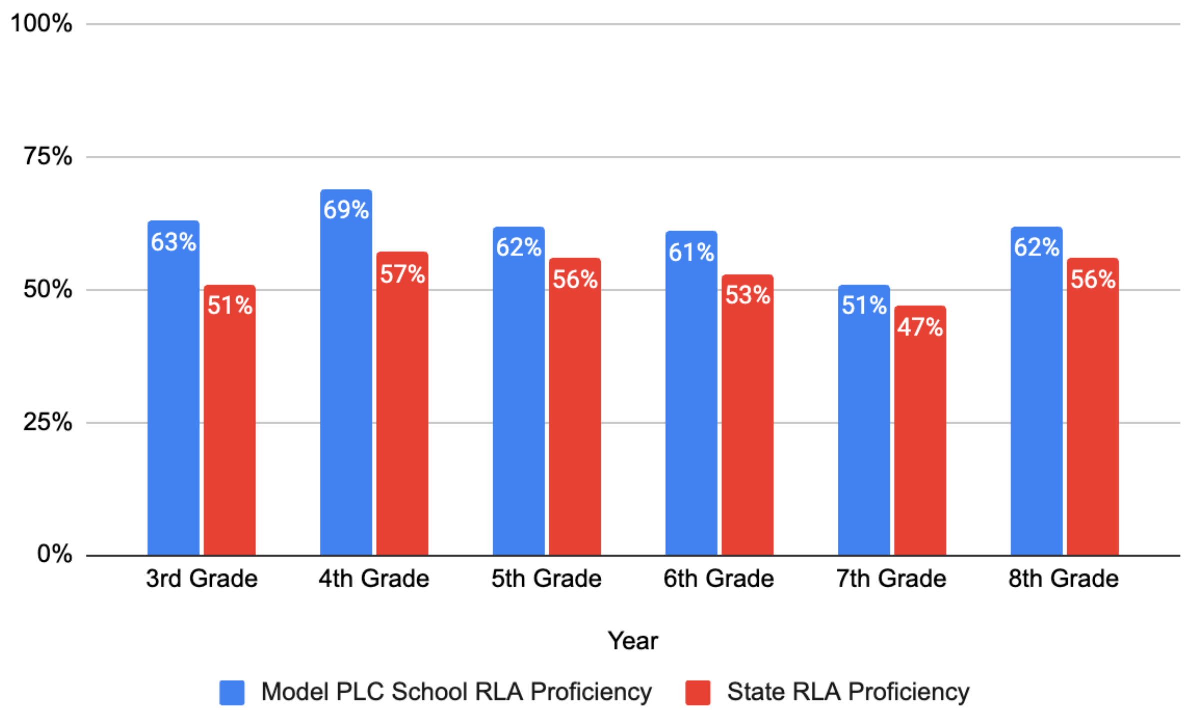


Note. This table illustrates a comparison between Model PLC at Work® School Math Proficiency Percentages using 2023 STAAR data as compared to state math proficiency percentages.

A similar pattern emerges in RLA. Figure 3 displays the comparison of RLA proficiency rates for the same campuses and grade levels.

Figure 3

2023 STAAR RLA Proficiency Comparison

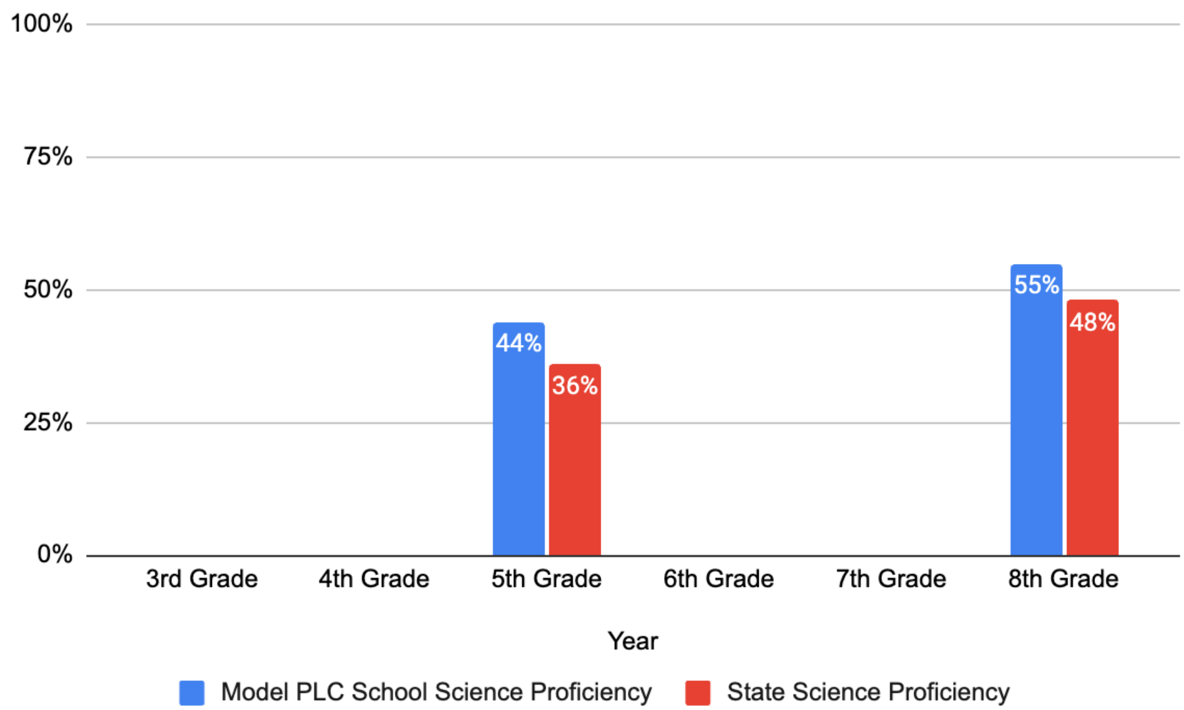


Note. This table illustrates a comparison between Model PLC at Work® School reading language Arts Proficiency Percentages using 2023 STAAR data as compared to state reading language arts proficiency percentages.

Again, Model PLC at Work® schools outperform statewide averages in every grade level. The gaps in RLA are slightly wider than in mathematics, ranging from 4 to 12 percentage points. Science proficiency comparisons follow the same trend. Because STAAR science is administered in grades 5 and 8, Figure 4 provides the subject specific comparison for only those two grades.

Figure 4

2023 STAAR Science Proficiency Comparison



Note. This table illustrates a comparison between Model PLC at Work® School Science Proficiency Percentages using 2023 STAAR data as compared to state science proficiency percentages.

To deepen the descriptive portion, we also compare proficiency patterns by school poverty level, using free and reduced-priced lunch eligibility as a proxy for economic disadvantage. Schools are grouped into four categories: low-poverty (less than 25% eligible), mid-low poverty (25.1–50%), mid-high poverty (50.1–75%), and high-poverty (more than 75%). This additional comparison helps us better understand achievement patterns, particularly because Model PLC at Work® schools are more frequently located in urban and suburban settings where poverty levels vary substantially between campuses. We begin with low-poverty schools. Table 4 provides the proficiency comparison for these campuses.

Table 4. *2023 STAAR Proficiency Comparison For Low Poverty Schools*

Year	Model PLC at Work® School Math Proficiency	State Math Proficiency	Model PLC at Work® School RLA Proficiency	State RLA Proficiency	Model PLC at Work® School Science Proficiency	State Science Proficiency
3rd Grade	91%	89%	78%	75%		
4th Grade	90%	87%	84%	82%		
5th Grade	95%	93%	82%	81%	62%	60%
6th Grade	93%	92%	83%	79%		
7th Grade	91%	90%	78%	74%		
8th Grade	92%	93%	85%	81%	74%	75%

Note. This table compares STAAR proficiency percentages for Model PLC at Work® schools to statewide averages in schools classified as low poverty (25% or fewer students eligible for Free or Reduced Lunch) using 2023 STAAR data.

As Table 4 illustrates, Model PLC at Work® schools in low-poverty settings perform similarly to or slightly above statewide averages. Next, Table 5 examines mid-low poverty schools. This category includes a substantial share of Model PLC at Work® schools.

Table 5. *2023 STAAR Proficiency Comparison For Mid-Low Poverty Schools*

Year	Model PLC at Work® School Math Proficiency	State Math Proficiency	Model PLC at Work® School RLA Proficiency	State RLA Proficiency	Model PLC at Work® School Science Proficiency	State Science Proficiency
3rd Grade	83%	80%	65%	61%		
4th Grade	82%	79%	72%	69%		
5th Grade	89%	86%	69%	67%	53%	45%
6th Grade	86%	84%	68%	63%		
7th Grade	79%	79%	59%	57%		
8th Grade	87%	86%	70%	66%	62%	60%

Note. This table compares STAAR proficiency percentages for Model PLC at Work® schools to statewide averages in schools classified as mid-low poverty (25.1 to 50% of students eligible for Free or Reduced Lunch) using 2023 STAAR data.

In mid-lower poverty contexts, the performance gap widens. Model PLC at Work® schools consistently exceed statewide average across math, RLA, and science, often by 5 to 9 percentage points. These patterns suggest that schools implementing the PLC at Work® process may be in a better position to maintain strong performance in increasingly diverse and economically mixed settings.

Table 6 presents proficiency trends for mid-high poverty campuses, where statewide performance levels tend to be lower overall.

Table 6. *2023 STAAR Proficiency Comparison For Mid-High Poverty Schools*

Year	Model PLC at Work® School Math Proficiency	State Math Proficiency	Model PLC at Work® School RLA Proficiency	State RLA Proficiency	Model PLC at Work® School Science Proficiency	State Science Proficiency
3rd Grade	77%	73%	57%	50%		
4th Grade	77%	69%	64%	58%		
5th Grade	79%	80%	53%	56%	35%	35%
6th Grade	80%	74%	55%	51%		
7th Grade	69%	68%	36%	44%		
8th Grade	85%	78%	58%	54%	52%	45%

Note. This table compares STAAR proficiency percentages for Model PLC at Work® schools to statewide averages in schools classified as mid-high poverty (50.1 to 75% of students eligible for Free or Reduced Lunch) using 2023 STAAR data.

Even within mid-high poverty campuses, Model PLC at Work® schools generally outperform statewide averages with several grades having substantial proficiency differences. Finally Table 7 reports proficiency comparisons for high-poverty campuses.

Table 7. *2023 STAAR Proficiency Comparison For High Poverty Schools*

Year	Model PLC at Work® School Math Proficiency	State Math Proficiency	Model PLC at Work® School RLA Proficiency	State RLA Proficiency	Model PLC at Work® School Science Proficiency	State Science Proficiency
3rd Grade	70%	65%	53%	39%		
4th Grade	70%	63%	49%	46%		
5th Grade	71%	73%	44%	45%	24%	38%
6th Grade	67%	65%	42%	49%		
7th Grade	60%	57%	35%	34%		
8th Grade	76%	74%	45%	44%	26%	38%

Note. This table compares STAAR proficiency percentages for Model PLC at Work® Schools to statewide averages in schools classified as mid-high poverty (75.1 to 100% of students eligible for Free or Reduced Lunch) using 2023 STAAR data.

Across all poverty levels, Model PLC at Work® schools generally maintain higher proficiency rates than statewide averages. In low-poverty settings, differences between Model PLC at Work® schools and the state tend to be modest but consistently positive. In mid-low and mid-high poverty categories, the gaps are somewhat larger, with several grades showing differences of 5 to 9 percentage points. In high-poverty schools, proficiency patterns vary by subject and grade, but Model PLC at Work® schools still typically meet or exceed statewide averages, even in contexts where overall state achievement levels are lower.

2.5 Summary of Findings

Model PLC at Work® schools share several common characteristics that provide important context for interpreting subsequent student outcomes and workforce analyses found throughout this report. First, these campuses are overwhelmingly located in urban and suburban regions of Texas, particularly in the eastern and southeastern parts of the state. Rural and charter districts remain significantly underrepresented, suggesting differences in capacity, resources, and professional development access that influence the likelihood of pursuing designation.

Demographically, Model PLC at Work® schools serve diverse student populations but differ in some respects from the statewide averages. On average, these campuses enroll lower proportions of economically disadvantaged, Hispanic, and at-risk students, though recent cohorts reflect increasingly diverse and multilingual student populations. These patterns indicate that the mix of students served by designated schools has shifted over time as participation in the PLC at Work® process has broadened.

Baseline academic comparisons show that Model PLC at Work® schools consistently outperform the state in mathematics, reading language arts, and science, with proficiency advantages evident across grade levels and across all poverty bands. This higher performance is not causal evidence of PLC effects but provides a meaningful reference point for interpreting the longitudinal growth analyses presented in Section 3.

Finally, because the Model PLC at Work® designation is voluntary, participation reflects intentional leadership decisions and district capacity to engage in a multiyear improvement process. Schools must assemble evidence portfolios, document collaborative practices, and demonstrate sustained academic growth. These voluntary entry points likely signal organizational readiness, a commitment to continuous improvement, and a belief in the PLC at Work® process.

2.6 Recommendations

1. **Expand Geographic Representation**: Target outreach efforts to increase participation from rural, western, and non-metropolitan regions of Texas. Provide strategic staffing from Solution Tree specifically tasked with serving these districts and diversify professional development offerings beyond metropolitan hubs to ensure equitable access statewide.
2. **Support Rural Participation**: Provide tailored supports such as virtual PLC at Work® professional development sessions, modified application processes, and regional collaboration cohorts coordinated in partnership with regional Education Service Centers (ESC). Leveraging ESCs can help address the unique implementation challenges faced by rural districts.
3. **Strengthen Progress Monitoring**: Develop a district-level dashboard to track ongoing student achievement data, subgroup performance gaps, and educator collaboration metrics even after initial designation. Use this dashboard to facilitate continuous improvement efforts which support district goals and renewal applications from a district perspective. This would also help Solution Tree better understand long-term student outcomes and program evaluation.
4. **Advance Future Research**: Conduct qualitative case studies, interviews, and focus groups alongside quantitative analyses to examine implementation quality, contextual differences across schools, and long-term student outcomes. This approach will strengthen the evidence base supporting the PLC at Work® process and inform future efforts.

Recommendations for Practitioners and Leaders

1. **Prioritize Structures that Support Protected Collaboration Time:** Practitioners and leaders should prioritize creating master schedules that include regular, dedicated time for collaborative teams to engage in data analysis, instructional planning, and pedagogical reflection. Without this protective time, even schools committed to the PLC at Work® process may struggle to implement with fidelity or sustain progress over time.

2. **Strengthen Collaborative Structures and Norms**: Effective implementation of the PLC at Work® process hinges on strong collaborative practices. School leaders should invest in training team leads, establishing shared goals and vision, and reinforcing norms for productive team collaboration. Coupled with protected collaboration time for all educators, a structured protocol provides guidance for collaborative teams to focus on results and learning.
3. **Promote Cross-District Collaboration Among PLC at Work®-Adopting Schools**: With clusters of Model PLC at Work® schools in certain regions, there is an opportunity to build local professional learning networks. School leaders in these areas should proactively create connections across districts through shared professional development, intercampus learning walks, and co-analysis of student work or data for singleton teachers.

Section 3. Student Outcomes and Academic Effectiveness

This section presents the student achievement results associated with sustained implementation of the PLC at Work® process. Using longitudinal statewide data and a staggered difference-in-differences approach, we examine changes in student performance over time in mathematics and reading language arts (RLA), with additional attention to differences across grade spans and key student groups. The findings reported in this section focus on estimated learning gains following implementation of the PLC at Work® process, offering a clearer picture of how professional learning structures relate to student academic progress across diverse student groups.

3.1 Section Summary

- Overall Achievement Effects: Students in Model PLC at Work® schools experience measurable gains in both mathematics and reading, with effects strengthening over multiple years of implementation and becoming most pronounced by Year 3.
- Grade-Span Patterns: Positive achievement trends appear across elementary and middle school students, with both showing positive growth.
- Subgroup Outcomes: Economically disadvantaged students and English learners exhibit some of the largest improvements, with gains that exceed those of the overall student population, suggesting that sustained PLC at Work® practices may help narrow longstanding opportunity gaps.
- Implementation Trajectory: Achievement effects unfold gradually, beginning modestly in the first year and increasing over time. This pattern aligns with the PLC at Work® theory of change, which emphasizes long-term development of collaborative structures, data use, and instructional coherence rather than short-term interventions.

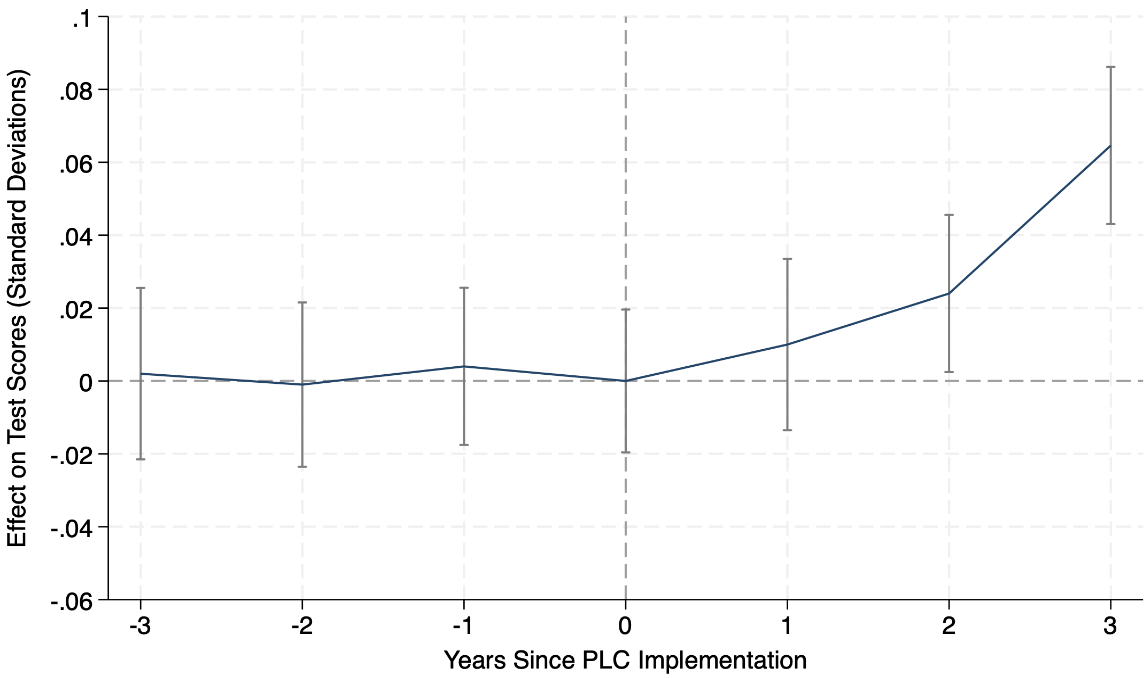
3.2 Mathematics Gains

This subsection summarizes changes in mathematics performance associated with multiyear implementation of the PLC at Work® process. We use statewide longitudinal data and compare learning trajectories for students in Model PLC at Work® schools to matched comparison campuses, focusing on overall trends, differences by grade span, and outcomes for key student populations. Technical details, including model specifications, matching procedures, and estimation strategies are provided in Appendix A.

Across the full sample, students in Model PLC at Work® schools show clear and positive gains in mathematics following implementation. As illustrated in Figure 5, mathematics performance remains comparable to the matched comparison group in the years prior to PLC implementation, indicating similar baseline trends. After implementation begins, achievement gradually improves, with small but positive differences emerging in Year 1 and strengthening in Year 2. By Year 3, the point at which schools typically apply for Model PLC at Work® designation, the estimated impact reaches its largest magnitude (0.063 SD). This represents approximately 3.1 months of additional learning compared to peers in non-Model PLC at Work® schools. This upward trajectory suggests that mathematics gains accumulate over time as collaborative practices and instructional routines become more deeply embedded in school culture.

Figure 5

Math Achievement, Overall

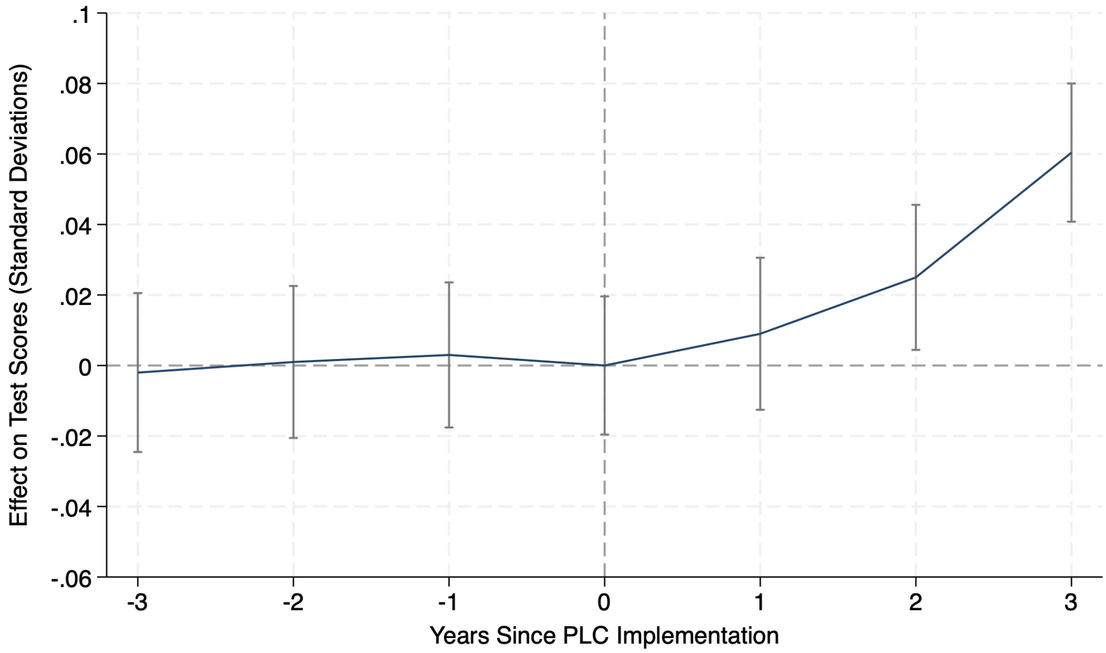


Math Achievement in Middle School

Building on these overall math trends, we next examine whether the effects of PLC at Work® implementation vary by grade span. Middle schools represent a distinct instructional context, with departmentalized structures. Figure 6 focuses specifically on mathematics outcomes for students in grades 6–7.

Figure 6

Math Achievement Differences, Middle School



Middle school mathematics results show a clear pattern of improvement that emerges gradually and becomes more pronounced as PLC at Work® practices mature. As shown above in Figure 6, achievement differences between Model PLC at Work® schools and matched comparison campuses are small and statistically indistinguishable from zero in the years prior to implementation, indicating that these schools did not begin with unusually strong or weak trends compared to similar campuses.

Following implementation, however, the trajectory shifts. In Year 1, middle school students show modest but positive gains (0.012 SD), suggesting early benefits as collaborative structures begin taking shape. These effects increase to 0.032 SD in Year 2 and become more substantial by Year 3, reaching 0.060 SD, or roughly 3.1 months of additional learning.

Consistency in the Year 3 estimates, along with narrower confidence intervals relative to earlier years, suggests that PLC at Work® practices may require time to stabilize within departmentalized middle school teams. As routines for planning, data monitoring, and targeted intervention deepen, achievement effects become more consistent across campuses. Collectively, these findings indicate that sustained PLC at Work® practices support meaningful improvements in middle school mathematics performance.

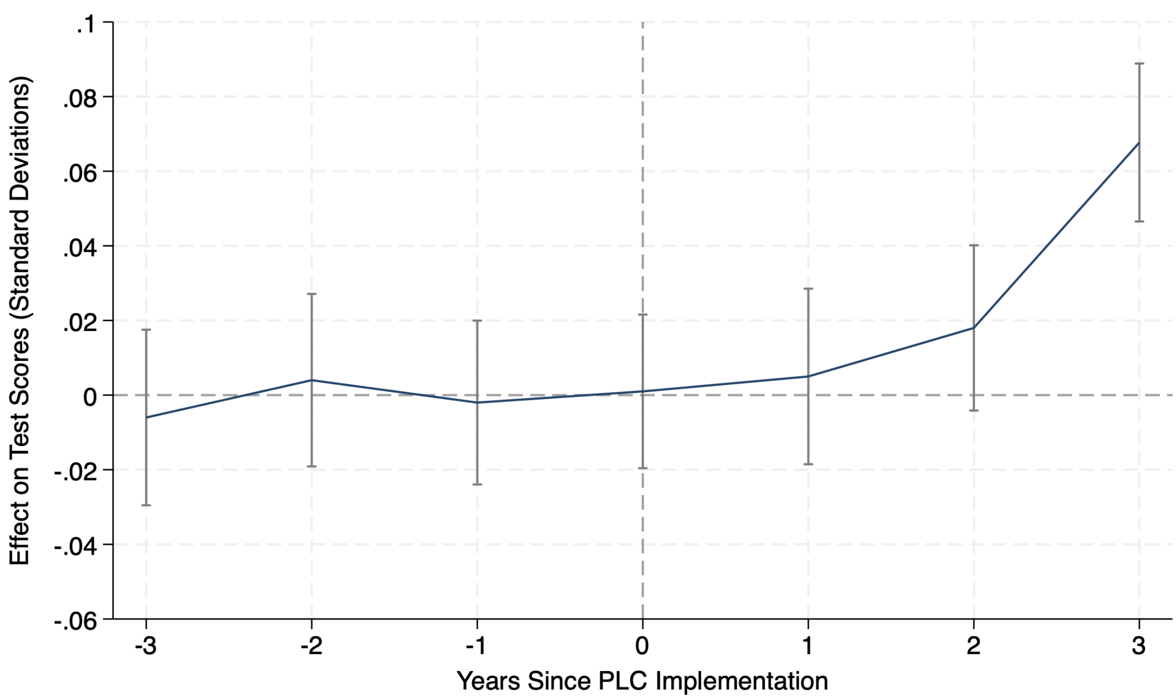
Math Achievement in Elementary School

Elementary trends reveal a pattern of steady improvement following implementation of the PLC at Work® process. As shown in Figure 7, achievement trends for elementary students (grades 4-5) closely track those of the matched comparison group in the pre-implementation years, with differences that are small and statistically indistinguishable from zero. This alignment provides additional support for the parallel trends assumption and indicates that designated schools did not begin with unusually strong baseline performance relative to similar peers.

After implementation begins, elementary mathematics outcomes strengthen noticeably. In Year 1, effects remain small (0.005 SD). By Year 2, the effect increases to 0.094 SD, indicating a more pronounced impact. In Year 3, the estimated effect reaches 0.068 SD, equivalent to approximately 3.2 months of additional learning compared to students in non-Model PLC at Work® schools.

Figure 7

Math Achievement Differences, Elementary School



Math Achievement for Economically Disadvantaged Students

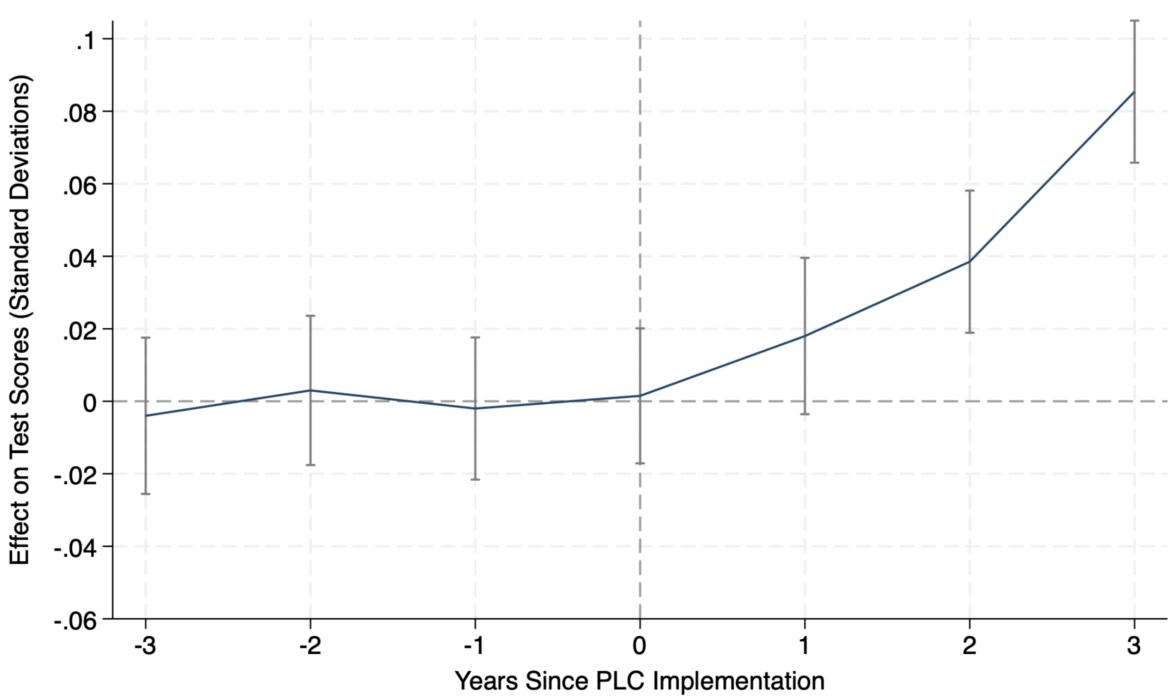
Economically disadvantaged students demonstrate some of the strongest mathematics gains associated with sustained implementation of the PLC at Work® process. As shown in Figure 8, differences between Model PLC at Work® schools and comparison schools are negligible in the pre-implementation years, suggesting that designated schools did not begin with an advantage for this subgroup, which again reinforces the validity of the matched comparison.

Following implementation, the trajectory for economically disadvantaged students improves steadily. In Year 1, the estimated effect increases modestly to 0.019 SD, followed by a larger gain of 0.039 SD in Year 2. By Year 3, the impact reaches 0.083 SD, or about 4.1 months of additional learning. The trend is gradual and consistent, with wider confidence intervals early on that tighten in later years.

These results indicate that economically disadvantaged students not only benefit from the PLC at Work® process, but do so at a rate that exceeds the overall sample. The gradual tightening of confidence intervals in later years further suggests increasing consistency across campuses, as PLC structures mature and collaborative systems become more rooted in daily instructional practice.

Figure 8

Math Achievement Differences, Economically Disadvantaged



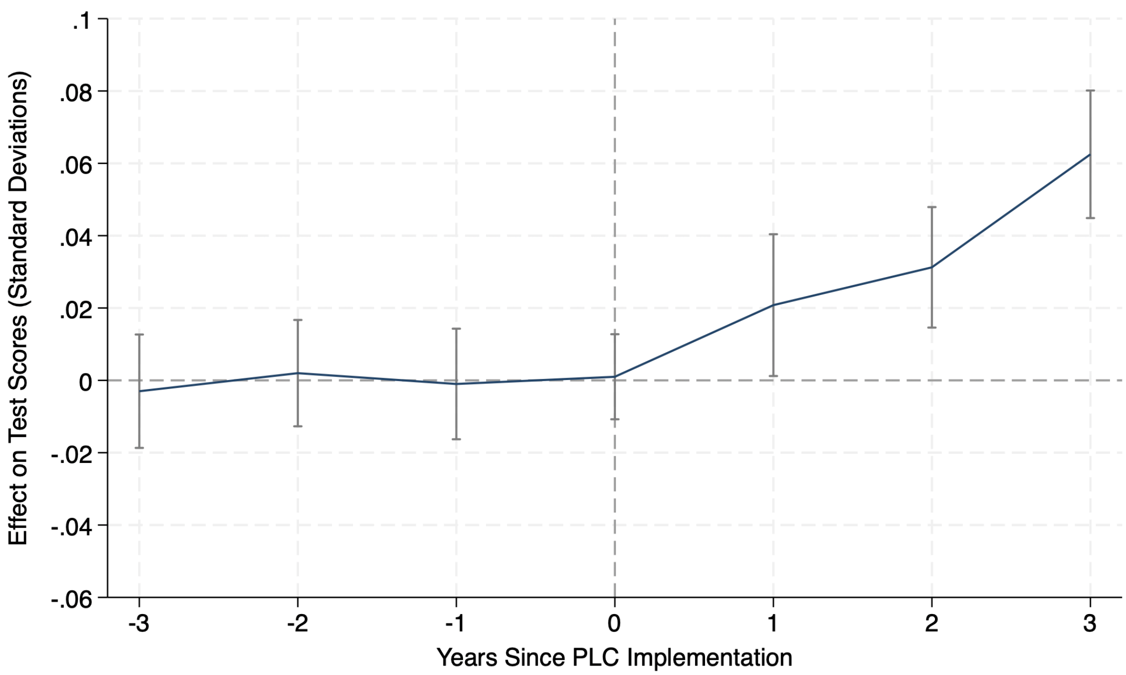
Math Achievement for English Learners

English Learner (EL) students also experience positive mathematics gains following sustained implementation of the PLC at Work® process. As depicted in Figure 9, pre-implementation estimates fluctuate but remain indistinguishable from zero, as in other models. Once implementation begins, EL students show gradual and consistent improvements. Effects in Years 1 and 2 are relatively modest at 0.020 and 0.031 SD, respectively. By Year 3, the effect increases to 0.061 SD, equivalent to roughly 3 months of additional math learning.

While these effects are somewhat smaller than those observed for economically disadvantaged students, the trend remains positive and directionally consistent with the broader population.

Figure 9

Math Achievement Differences, English Learners



3.3 Reading Gains

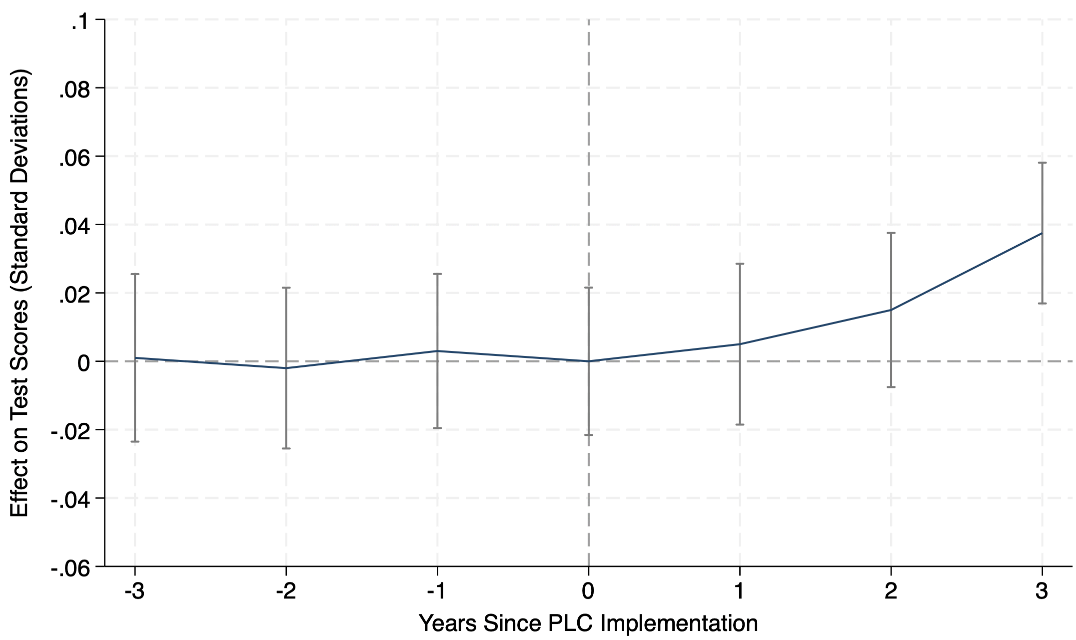
This subsection summarizes changes in reading language performance associated with multiyear implementation of the PLC at Work® process, parallel to the mathematics analysis in the previous subsection. We again use statewide longitudinal data, we compare learning trajectories for students in

Model PLC at Work® schools to those in matched comparison campuses, with attention to overall trends, differences by grade span, and outcomes for key student populations.

As shown in Figure 10, reading achievement follows a similar pattern to mathematics, though a somewhat flatter trajectory. The estimated effect in Year 1 is just 0.007 SD, increasing to 0.018 SD in Year 2. By Year 3, the effect grows to 0.039 SD which is equivalent to approximately 1.8 months of additional reading progress for students in Model PLC at Work® schools compared to their peers. As with mathematics, these gains accumulate gradually, suggesting that improvements in reading are tied to the strengthening of collaborative planning, data use, and instructional routines over time as well.

Figure 10

Reading Achievement, Overall



Reading Achievement for Middle School

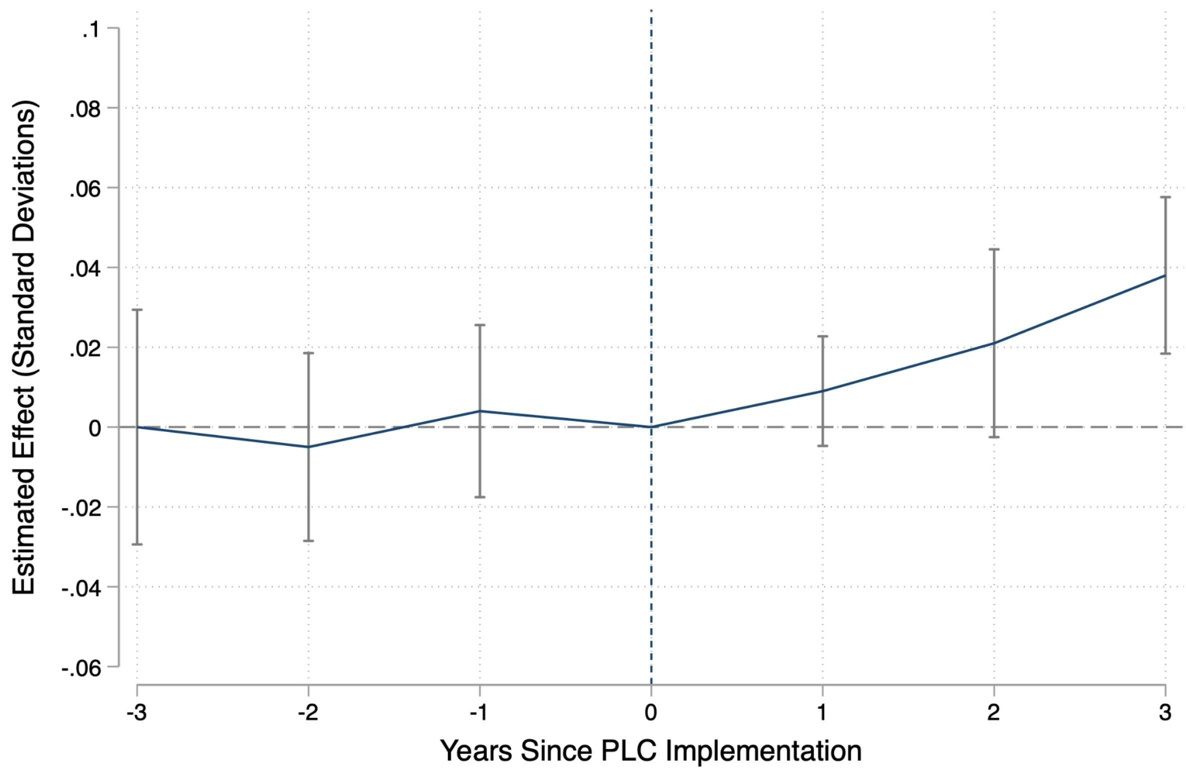
Reading outcomes for middle school students (grades 6–7) show a period of gradual improvement following the implementation of the PLC at Work® process. As shown in Figure 11, estimates in the pre-implementation period are near zero and not statistically distinguishable from those in the comparison group. This alignment mirrors math results and provides additional support for the parallel trends assumption.

After the implementation of the PLC at Work® process, positive effects emerge. In Year 1, the estimated impact is modest but directionally consistent (0.009 SD). The effect increases to 0.021 SD in Year 2 and reaches 0.038 SDs in Year 3, which is equivalent to approximately 1.7 months of additional learning compared to students in non-Model PLC at Work® schools.

Although the magnitude of these gains is smaller than those observed in mathematics, the pattern demonstrates steady improvement and suggests that sustained collaborative practices also contribute meaningfully to middle school reading achievement.

Figure 11

Reading Achievement Differences, Middle School

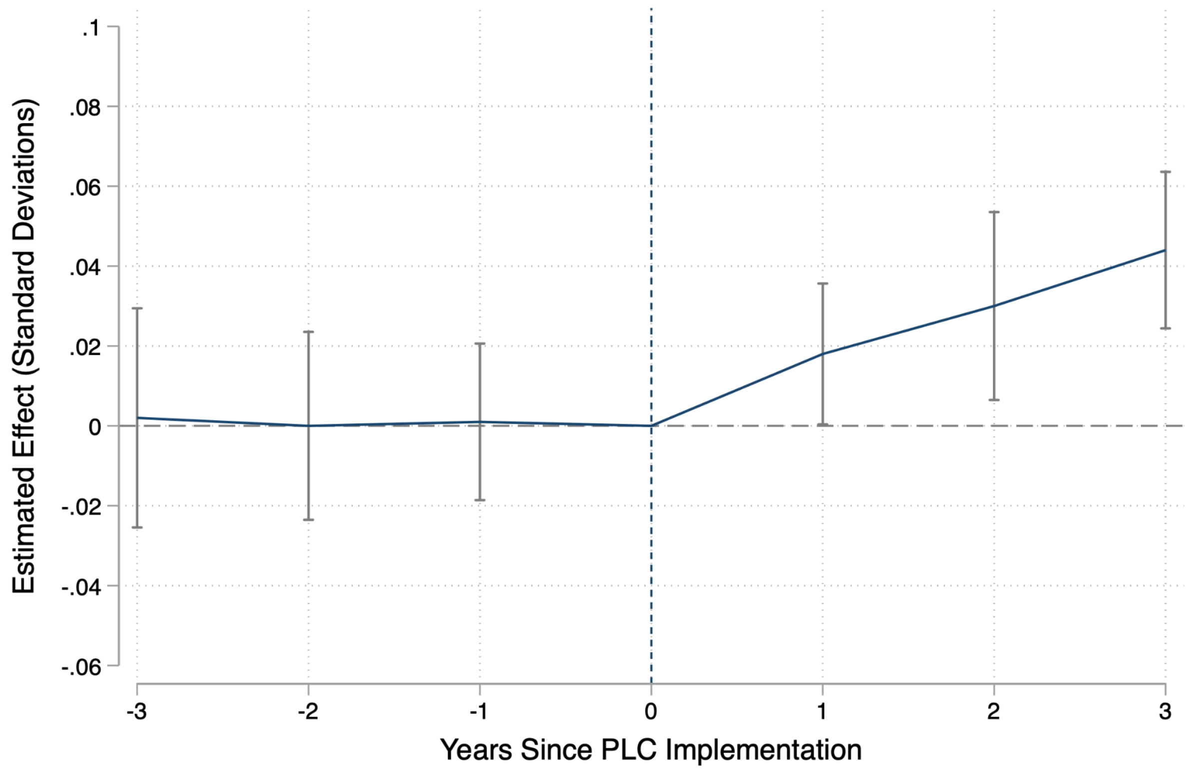


Reading Achievement for Elementary School

Elementary reading outcomes also show steady improvement following implementation. As shown in Figure 12, reading achievement levels for students in Model PLC at Work® schools closely mirror those of matched comparison campuses in the pre-implementation period. After implementation, reading gains become more evident. In Year 1, students in Model PLC at Work® schools outperform their peers by 0.018 SDs. This effect grows to 0.039 SD in Year 2, and increases further to 0.044 SD in Year 3, which is equivalent to an estimated 2.1 months of additional learning.

Figure 12

Reading Achievement Differences, Elementary School



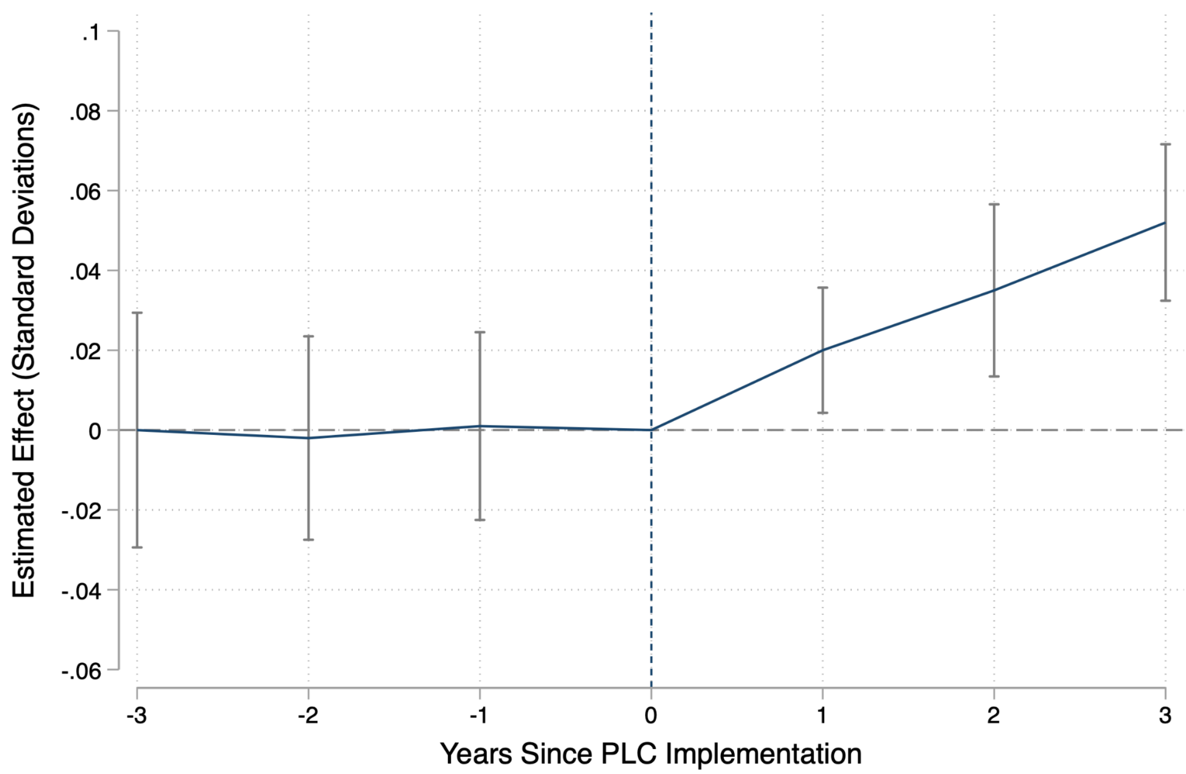
Reading Achievement for Economically Disadvantaged Students

Economically disadvantaged students also demonstrate meaningful and sustained improvements in reading achievement. As shown in Figure 13, pre-implementation estimates for this subgroup remain close to zero and statistically indistinguishable from the comparison group. Following implementation, reading outcomes for economically disadvantaged students improve steadily. In Year 1, the estimated effect increases to 0.20 SD. Then grows to 0.035 in Year 2, and reaches 0.052 in Year 3. We estimate this to be approximately 2.5 months of additional learning.

Importantly, the effect sizes for economically disadvantaged students are larger than those observed for the overall population, suggesting that the PLC at Work® process may be especially beneficial for students who have historically faced persistent opportunity gaps.

Figure 13

Reading Achievement Differences, Economically Disadvantaged Students



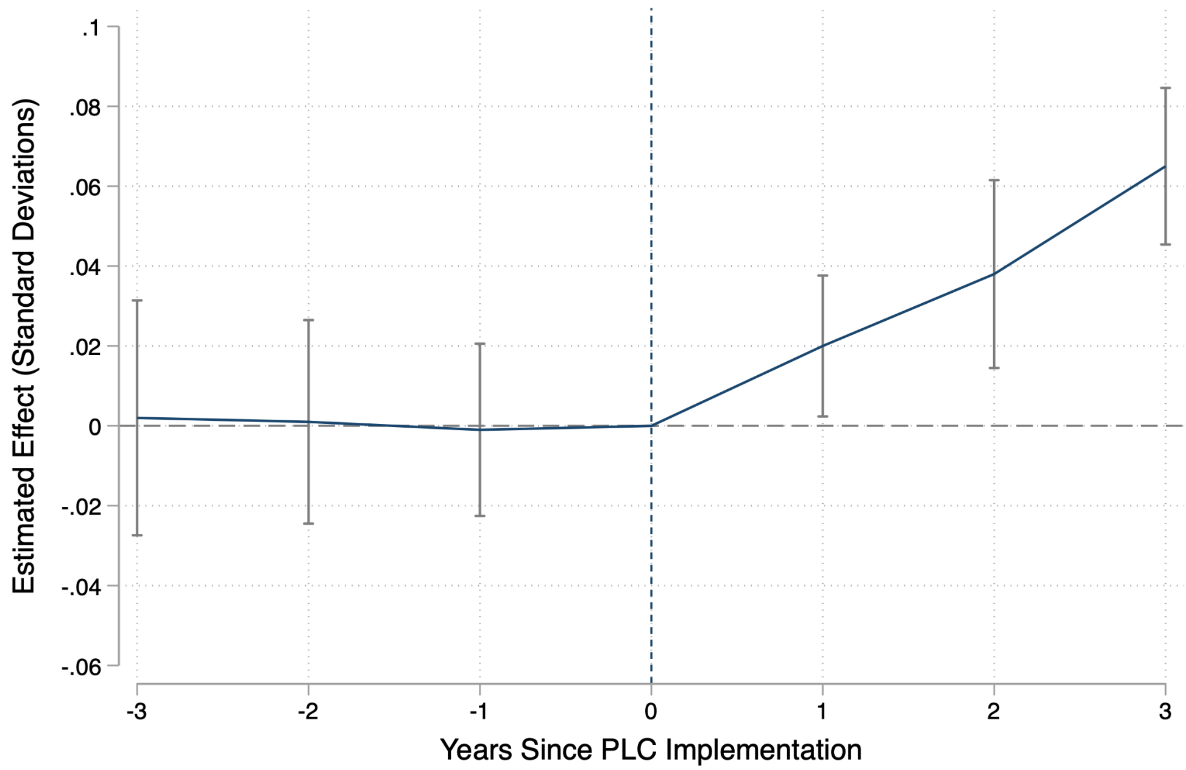
Reading Achievement for English Learners

English Learner students also show clear and positive improvements in reading achievement. As shown in Figure 14, pre-implementation estimates remain statistically indistinguishable from zero, indicating similar baseline trends between Model PLC at Work® schools and their matched comparison campuses.

Beginning in Year 1, we see a positive trend with an estimated effect of 0.020 SD. This grows to 0.038 SD in Year 2 and reaches 0.065 SD in Year 3 which is equivalent to approximately 3.3 months of additional learning. In comparison to math gains of English Learner students, these gains suggest that the PLC at Work® process may be especially effective in supporting language development. Given that literacy is a foundational skill tied to long-term academic success, these findings underscore the potential of sustained professional collaboration to accelerate progress for EL students in core content areas.

Figure 14

Reading Achievement Differences, English Learners



3.4 Dynamic Effects over Time

The patterns across mathematics and reading achievement reveal a consistent positive trend. Effects begin modestly in the first year following PLC at Work® process implementation, strengthen gradually in the second year, and reach their largest magnitude by Year 3 of the study. Across all models, pre-implementation estimates remain flat and close to zero, providing strong evidence of parallel trends prior to the adoption of the PLC at Work® process. This strengthens confidence in the validity of the comparison and supports the interpretation that subsequent improvements reflect changes occurring during the implementation period.

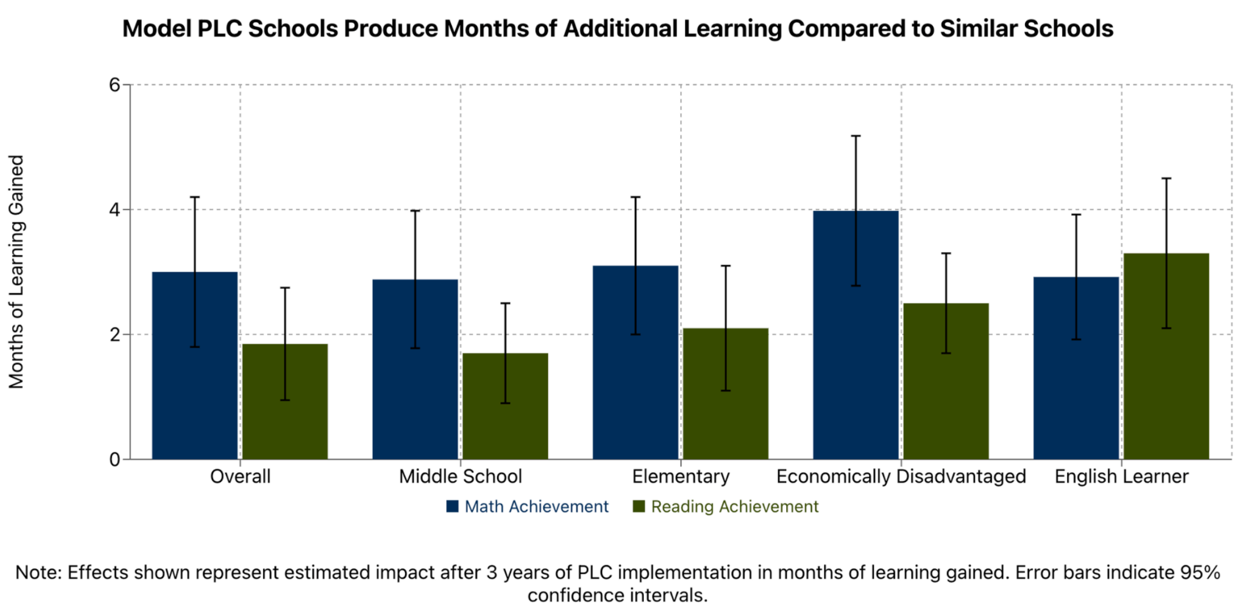
Figure 15 summarizes the estimated effects for mathematics and reading. Mathematics gains show a steeper trajectory, with cumulative effects reaching an average of 3.1 months of additional math learning by Year 3, a statistically significant gain that reflects consistent improvement over time. Reading gains, while smaller, are still meaningful, with an average of approximately 1.8 months of additional progress. Grade span analysis reveals similar upward trajectories for both elementary and middle school students. Middle school effects tend to materialize more gradually while elementary effects increase more sharply in Year 2.

Importantly, the strongest effect is observed among historically underserved student groups. Economically disadvantaged students gained 4.0 months of additional math learning—an especially notable result given the persistent opportunity gaps that exist for this population. English Learners also benefited, with an estimated gain of 3.0 months in math, slightly exceeding the overall average and, notably, an even greater gain of 3.3 months in reading. This suggests that the PLC at Work® framework may be particularly well suited to support multilingual learners when implemented with fidelity. The relatively stronger effect in reading for EL students highlights the importance of collaborative planning and data-informed instruction in advancing language development alongside content mastery.

These findings not only reinforce the effectiveness of the PLC at Work® process at improving student outcomes, but also demonstrate its potential to support particularly vulnerable student populations, especially when implemented with fidelity over multiple years.

Figure 15

Additional Months of Learning Gained



3.5 Summary of Findings

This analysis offers early but promising evidence that implementation of the PLC at Work® process is associated with sustained improvements in student achievement across a variety of educational settings. While the magnitude of gains varies, the general pattern across student groups and grade levels suggests that the process has the potential to positively influence academic outcomes when practices are implemented over multiple years. These effects are most apparent in the third year following schools' implementation in years 1 and 2, aligning with the program's design, which emphasizes long-term shifts in instructional practice, collaboration, and data use rather than short-term interventions.

Across analyses, the data indicate a consistent trajectory: achievement gains begin modestly in the first year of implementation of PLC at Work® practices, grow incrementally in the second, and become more pronounced by the third. This gradual pattern is consistent with a theory of change that requires time for schools to build collaborative structures, refine instructional strategies, and embed continuous improvement practices into daily routines. From an evaluation perspective, this delayed ramp-up reinforces the importance of examining long-term implementation results rather than relying solely on short-term outcome measures.

In examining different student groups, we find that achievement gains occur broadly but are particularly pronounced for certain populations. Students in middle and elementary grades both show improvements, though the timing and slope of the gains differ slightly, suggesting that grade span may shape how quickly collaborative practices translate into academic results. Importantly, we also observe substantial gains for economically disadvantaged students and English learners—groups that are historically underserved populations. While this analysis does not unpack the specific mechanisms behind these subgroup effects, it is plausible that the structured, collaborative, and data-informed features of the PLC at Work® process offer additional support that may help more quickly identify the needs of all students.

It is important to note that this study is observational, not experimental; and while the design accounts for key sources of bias and includes appropriate comparison groups, it does not constitute a randomized controlled trial. That said, the patterns we observe—particularly the emergence of effects over time and the consistency across outcomes—are suggestive of a credibly causal relationship between PLC implementation and student achievement. Further research could strengthen these findings by exploring variation in fidelity of implementation, leadership conditions, or alignment with district-level initiatives.

Taken together, these findings point to the PLC at Work® model as a potentially valuable investment for schools seeking to strengthen instructional quality and improve student outcomes over time. District leaders and policymakers may wish to consider how to support long-term implementation through time for teacher collaboration, systems for monitoring progress, and access to formative assessment data. While the results are not definitive, they indicate that multi-year investments in a schoolwide focus collaboration, learning, and results may lead to measurable gains in student learning.

3.6 Recommendations

Recommendations

1. **Expand Access in Rural and High-Needs Districts**: To improve geographic equity and support underserved populations, Solution Tree should launch targeted initiatives for rural and high-poverty schools. These effects would build capacity in high-needs schools and help extend long-term impact to students with the greatest need, highlighting our findings that suggest that these groups also have the greatest achievement gains.
2. **Establish a Texas Model PLC School Evidence Network**: Solution Tree could create a statewide peer learning network of Model PLC Schools to serve as demonstration sites, coaching hubs, and mentors. Since our findings suggest that the impact of the PLC at Work® process increases over time, more veteran campuses (such as Ambassador sites) could mentor new and aspiring implementers.
3. **Provide a Gap Analysis for Contracted Campuses and Districts**: To support readiness and strategic planning, Solution Tree should offer a gap analysis to assess infrastructure, leadership alignment, and collaborative structures on contracted campuses. This diagnostic tool would guide detailed implementation roadmaps and ensure that support aligns with a campus's current capacity, paving the way for fidelity of implementation and future designation.
4. **Conduct a Follow-up Study Focused on High School Outcomes**: A future study should evaluate how PLC implementation affects high school End-of-Course (EOC) performance, graduation rates, and college and career readiness indicators. By leveraging state longitudinal data, this research would provide insight into the long-term impact of PLC practices on postsecondary success and inform refinements to the model and support in secondary settings.

Recommendations for Practitioners and Leaders

1. **Prioritize Long-Term Implementation Over Short-Term Goals**: Leaders should adopt a multi-year implementation mindset when launching the PLC at Work® process. The data shows that the most meaningful gains in student achievement emerge in the third year of high-quality implementation. This means that there is a need for sustained focus, time for collaborative structures to mature, and ongoing support for teacher teams.
2. **Embed Protected Collaboration Time in the Master Schedule**: Effective implementation of PLC practices depends on regular, structured collaboration. Campus and district leaders should ensure that teacher teams have protected, weekly time to engage in data analysis.

3. **Create a Meaningful Protocol for Data Driven Instructional Practices**: Practitioners should develop clear systems for analyzing and responding to formative and summative assessment data. Campus leaders can model data-informed leadership by ensuring that instructional decisions, intervention plans, and celebrations of success are grounded in team-level and student-level learning trends.
4. **Strengthen Team Facilitation and Shared Leadership Structures**: One of the three big ideas of the PLC at Work® process is a focus on collaboration. Strong facilitation and shared accountability accelerated the impact of collaborative work. Leaders should invest in coaching or professional development for team leads to ensure they can guide teams through three big ideas and four critical questions of the PLC at Work® process.

Section 4. Teacher Retention and Workforce Stability

This section examines the teacher workforce patterns in Model PLC at Work® schools, focusing on teacher characteristics, baseline retention conditions, and changes in turnover following multiyear implementation of the PLC at Work® process. We again compare Model PLC at Work® schools to similar non-designated campuses to understand how teacher experience, certification pathways, and retention trends differ across contexts. We also explore whether implementation is associated with differential turnover among highly effective teachers and how patterns vary across school levels.

4.1 Section Summary

- Teacher Workforce Profile: Model PLC at Work® schools consistently employ a more experienced teaching force and a higher proportion of traditionally certified teachers compared to the statewide average.
- Certification Patterns: Across all designation years, Model PLC at Work® schools report fewer uncertified teachers and fewer teachers prepared through alternative pathways. Traditional university certification remains substantially higher than statewide norms.
- Baseline Retention Trends: Teacher turnover rates are systematically lower in Model PLC at Work® schools than in Texas overall.
- Post-Implementation Effects: Overall turnover does not significantly change following implementation; however, subgroup analyses reveal meaningful patterns. Highly-effective teachers become increasingly likely to remain, while turnover increases among lower-effective teachers.

4.2 Descriptive Overview of Teacher Workforce

This section provides descriptive context about teachers employed in Model PLC at Work® schools. Teacher workforce stability is an essential component of sustained instructional improvement. Table 8 presents teacher characteristics by designation year. Across all cohorts, teachers in Model PLC at Work® schools tend to be more experienced than the statewide teacher workforce. Average years of experience range from 7.5 to nearly 9 years, indicating that designated campuses consistently employ a veteran teaching workforce. Demographic distributions, including race, ethnicity, and gender, closely mirror statewide patterns.

Table 8. Descriptive statistics for teachers in Model PLC at Work® schools by designation year

	2015	2016	2017	2018	2019	2020	2021	2022	2023
Years of Experience	7.5	7.7	7.9	8.1	8.4	8.7	9	8.9	8.8
Asian	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Black	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.12
Latinx	0.25	0.25	0.26	0.27	0.27	0.29	0.29	0.29	0.3
White	0.63	0.62	0.61	0.61	0.61	0.61	0.57	0.57	0.56
Male	0.26	0.26	0.26	0.26	0.26	0.26	0.24	0.24	0.25
No Degree	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02

Tables 9 and 10 summarize teacher certification pathways and turnover for Model PLC at Work® schools and all Texas schools, respectively. Clear differences emerge between designated campuses and statewide trends. Model PLC at Work® schools employ a higher proportion of teachers certified through traditional university teacher certification programs, with nearly half of their teaching force holding this type of certification each year. In contrast, the state average has steadily declined, reaching only 36% of teachers in Texas with a traditional certification. Moreover, Model PLC at Work® schools employ fewer teachers certified through online and community/LEA sponsored programs, and importantly, they do not show the same rising trend in uncertified teachers that is observed statewide.

Table 9. Teacher certification and turnover descriptive statistics for teachers in Model PLC at Work® schools by designation year

	2015	2016	2017	2018	2019	2020	2021	2022	2023
Out of State	0.01	0.12	0.14	0.10	0.10	0.10	0.10	0.10	0.14
Online	0.08	0.10	0.09	0.13	0.12	0.16	0.17	0.17	0.14
Community/LEA	0.09	0.08	0.09	0.09	0.15	0.17	0.21	0.17	0.16
Other Alt.	0.02	0.07	0.00	0.04	0.05	0.04	0.04	0.05	0.04
University Alt	0.12	0.01	0.14	0.05	0.04	0.08	0.04	0.06	0.06
Uncertified	0.02	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Traditional Cert	0.48	0.55	0.50	0.65	0.46	0.42	0.43	0.45	0.45
District Turnover	0.14	0.14	0.12	0.09	0.12	0.11	0.14	0.14	0.14
Advanced Degree	0.19	0.16	0.13	0.14	0.23	0.22	0.17	0.21	0.26

Table 10. Teacher certification and turnover descriptive statistics for all Texas teachers per year

	2015	2016	2017	2018	2019	2020	2021	2022	2023
Out of State	0.08	0.08	0.08	0.08	0.08	0.08	0.09	0.09	0.09
Online	0.13	0.15	0.17	0.18	0.19	0.21	0.22	0.22	0.23
Community/LEA	0.20	0.19	0.19	0.18	0.17	0.16	0.16	0.16	0.16
Other Alt.	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
University Alt	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.08
Uncertified	0.00	0.00	0.01	0.01	0.02	0.02	0.04	0.06	0.06
Traditional Cert	0.43	0.41	0.41	0.40	0.38	0.38	0.37	0.36	0.36
District Turnover	0.17	0.18	0.17	0.17	0.17	0.16	0.16	0.20	0.21
Advanced Degree	0.23	0.23	0.23	0.23	0.23	0.23	0.24	0.24	0.24

This distinction between Model PLC at Work® schools and the state average matters because traditionally certified teachers are strongly associated with higher student achievement outcomes (Buchanan et al., 2013; Darling-Hammond et al., 2005; Kirksey & Gottlieb, 2024; May et al., 2003; Tournaki et al., 2009), meaning that Model PLC at Work® schools are not only retaining teachers but are retaining a population of teachers with stronger preparation backgrounds. Advanced degree attainment among teachers in Model PLC at Work® schools is roughly comparable to the statewide average, which suggests consistency in professional qualifications.

However, turnover rates tell a clear narrative. Teacher turnover is systematically lower in Model PLC at Work® schools than in the state overall for all years. In 2023, turnover rates in Model PLC at Work® schools were approximately 7 percentage points lower than the statewide average, which signals a more stable and sustainable workforce.

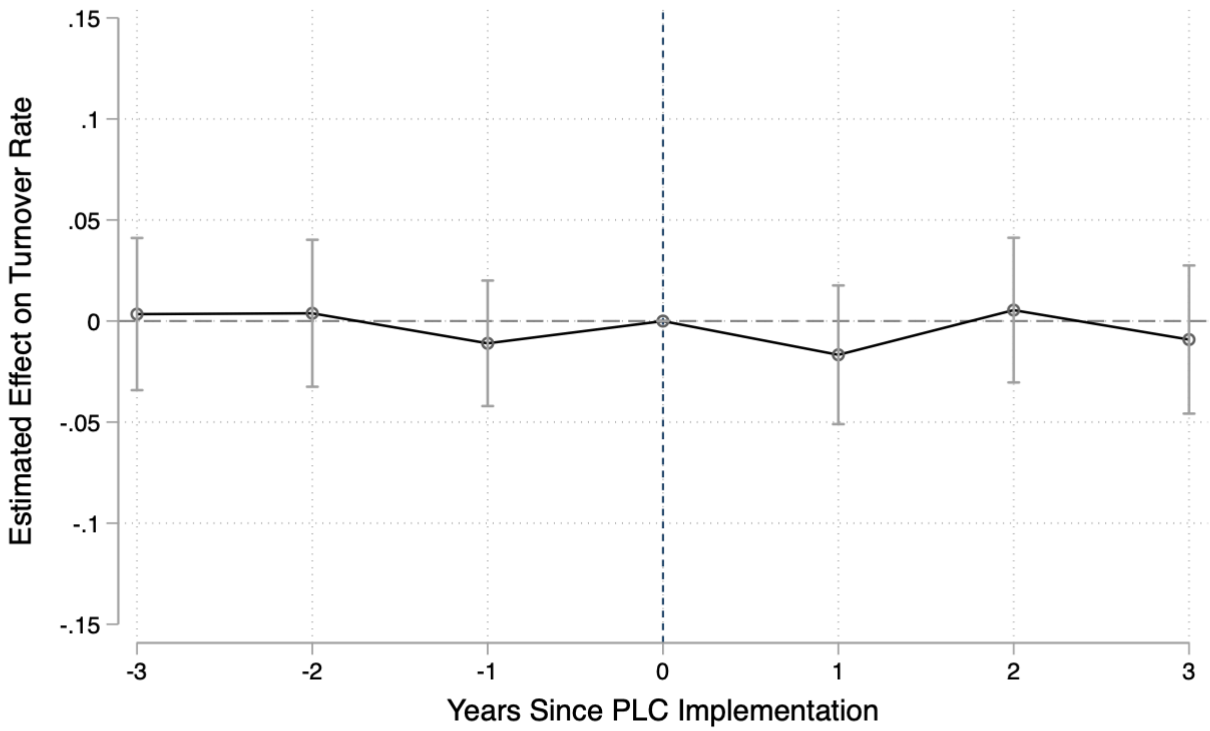
4.3 Retention Trends Over Time

This section summarizes teacher retention patterns associated with multiyear implementation of the PLC at Work® process. Similar to Section 3, we use statewide longitudinal data and a matched comparison design to examine how turnover trends change over time for teachers in Model PLC at Work® schools relative to similar campuses. Technical details are provided in the Appendix.
Figure 16 presents the event-study estimates of changes in teacher turnover before and after PLC at Work® process implementation. In the pre-implementation years, estimates for Model PLC at Work® schools and comparison campuses are small and statistically indistinguishable from zero, indicating that both groups followed similar turnover trends prior to adoption of the PLC at Work® process. This alignment supports the validity of the comparison design.

Following implementation, the estimated effects remain small and not statistically distinguishable from zero. The point estimates fluctuate slightly around zero, with a modest positive deviation in year +2. These findings indicate that, on average, implementation of the Model PLC initiative did not produce detectable changes in teacher turnover rates in the first three years following adoption. Given that Model PLC at Work® schools begin with lower turnover rates than that statewide average, maintaining stability over time is itself a notable finding.

Figure 16

Dynamic effects of Model PLC at Work® process on teacher turnover



While the estimated effects in Figure 1 are statistically indistinguishable from zero, it is important to view these results alongside the descriptive evidence presented earlier. Model PLC at Work® schools already demonstrate higher baseline retention and a greater proportion of traditionally certified teachers than the state average. In that context, the lack of significant post-implementation changes suggests that the PLC at Work® process is not associated with additional turnover risk, and that schools may be sustaining their relatively strong teacher retention levels over time.

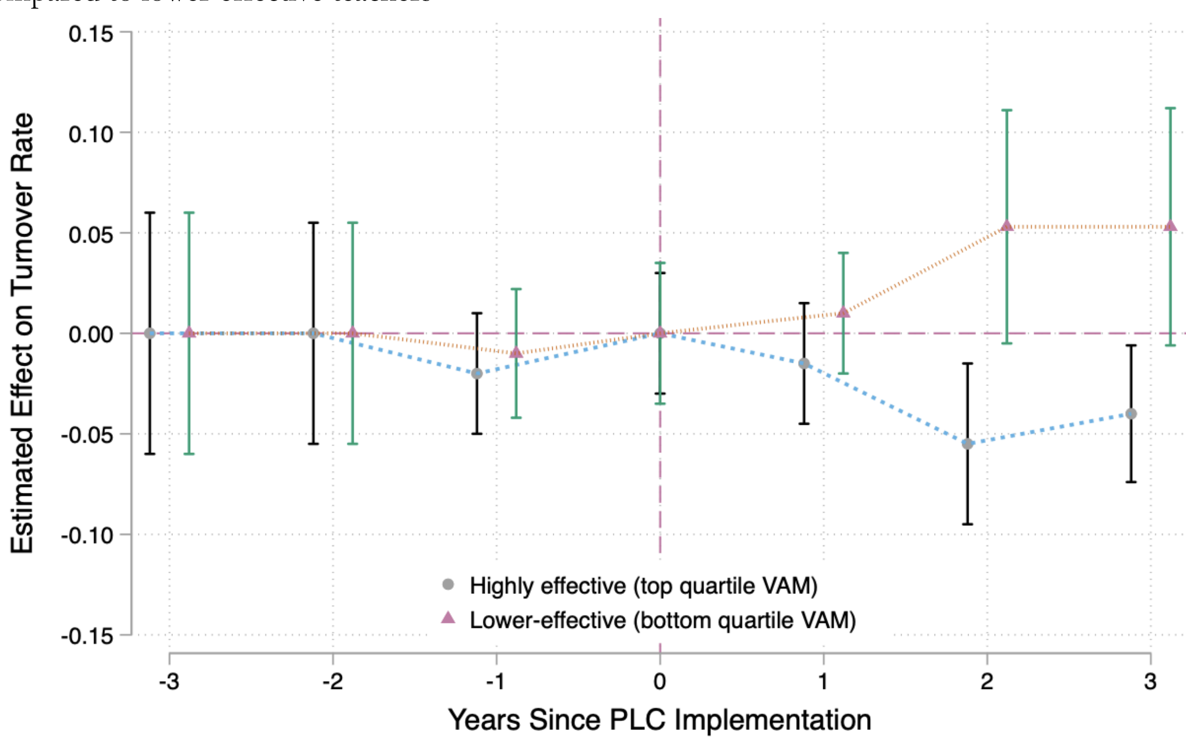
4.4 Selective Retention of Highly Effective Teachers

To better understand whether implementation affects different types of teachers in different ways, Figure 17 disaggregates turnover patterns by teacher effectiveness, measured using prior value-added scores. We define *highly effective teachers* as those in the top quartile of value-added measures and *lower-effective teachers* as those in the bottom quartile in their school district. Value-added models estimate a teacher's contribution to student learning growth by examining how much growth their students make on standardized tests as compared to their expected growth. This figure explores whether the implementation differentially influenced turnover for teachers who were more or less effective prior to implementation.

Pre-implementation trends again show no meaningful difference between groups. Point estimates for both highly effective and lower-effective teachers are near zero and statistically indistinguishable from one another, providing support for the parallel trends assumption across subgroups.
After implementation, however, patterns diverge significantly. For highly effective teachers, the estimated effect on turnover becomes increasingly negative beginning in year 1 and grows more pronounced in years 2 and 3, reaching approximately –0.05 to –0.07. This suggests that highly effective teachers are more likely to remain at Model PLC at Work® schools over time.
In contrast, for lower-effective teachers, the estimates shift in the opposite direction following implementation. Starting in year 2, the estimated effect becomes modestly positive and remains elevated in year 3, indicating a potential increase in turnover among lower-effective teachers. These differences imply that there may be some form of selective retention: encouraging persistence among highly effective teachers while accelerating attrition among their less effective peers.

Figure 17

Dynamic effects of Model PLC at Work® process on teacher turnover for highly effective teachers as compared to lower-effective teachers



These findings are consistent with the broader descriptive evidence that Model PLC at Work® schools have lower overall turnover than the state average. More importantly, the results suggest that selective retention may be occurring, keeping highly effective teachers in classrooms while natural attrition occurs among less effective peers leading to long-term stability of highly effective teachers across all school levels.

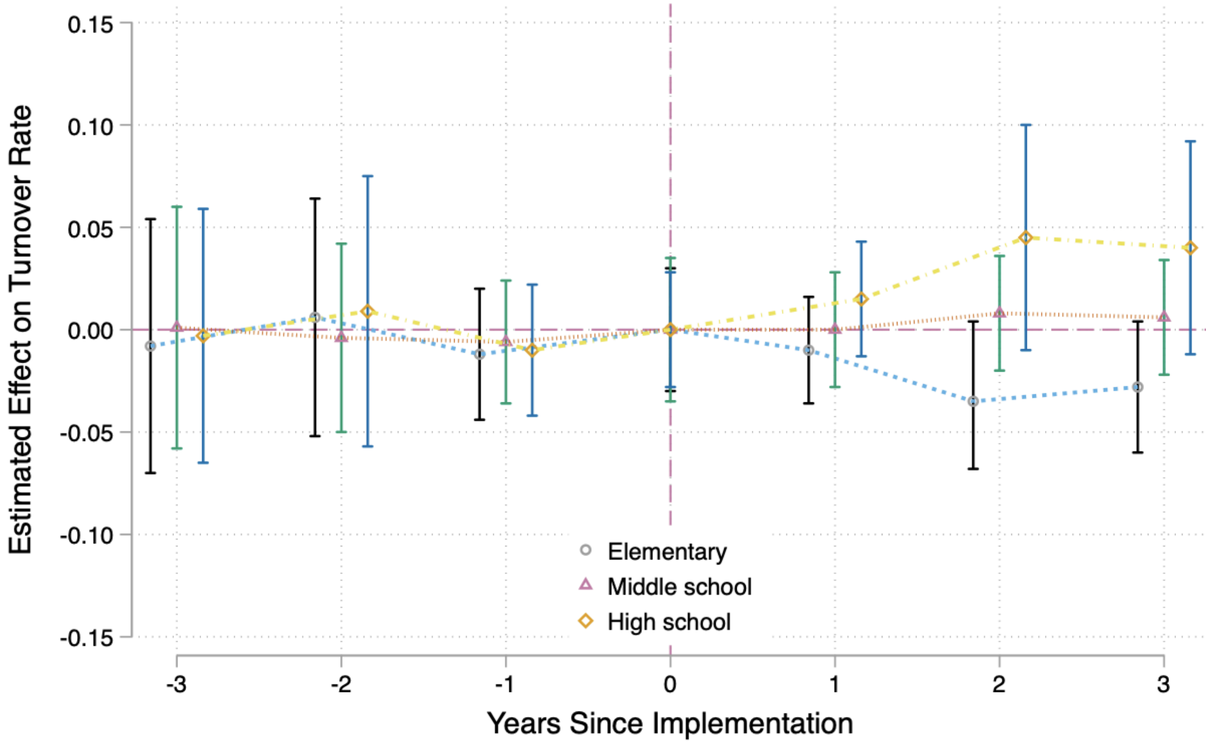
4.5 Variation by School Level

Figure 18 presents the dynamic, event-time estimates of the implementation of the PLC at Work® process on teacher turnover rates, disaggregated by elementary, middle, and high school campuses. As in previous figures, all estimates are relative to the year prior to implementation, which serves as the reference group. In the pre-implementation period, the estimated effects for all three school levels are near zero and statistically indistinguishable, suggesting no evidence of differential pre-trends in teacher turnover prior to PLC at Work® adoption across school levels.
Following implementation, turnover patterns begin to diverge across school levels. Elementary schools show the clearest movement toward increased workforce stability. Beginning in Year 2, turnover estimates trend downward and remain negative through Year 3, reaching reductions in teacher turnover of roughly 5–6 percentage points. Although confidence intervals for these effects cross zero, meaning the results are not statistically significant, the consistent downward trend suggests that implementation of the PLC at Work® process may promote greater retention among elementary educators as collaborative routines become more established.

In contrast, middle schools show no discernible changes in turnover rates following implementation. The estimates remain flat and near zero throughout the event window, indicating that the PLC initiative may have had little to no measurable impact on the average turnover rate across all middle school teachers. High school turnover effect estimates trend upward in years 2 and 3, suggesting a potential increase in turnover, but these effects are not statistically significant. As with the other two school levels, the confidence intervals stretch across the zero threshold, indicating that we cannot conclude that high schools experienced changes in teacher turnover following the implementation of the PLC at Work® process. Overall, the variation by school level highlights that the PLC at Work® process does not influence teacher turnover uniformly.

Figure 18

Dynamic effects of teacher turnover by school level



4.6 Summary of Findings

The teacher workforce analysis offers several insights into how the PLC at Work® process relates to educator retention and workforce stability in Texas schools. We know from descriptive results that Model PLC at Work® schools already employ more traditionally certified teachers, fewer uncertified teachers, and report lower turnover rates than the Texas average. These patterns suggest that campuses applying for designation tend to have stronger professional foundations in place prior to adoption, making any additional effects on turnover especially notable. Even modest improvements in retention matter in this context since these schools already start with higher-than-average stability. The impact analyses show that overall teacher turnover following Model PLC at Work® School designation does not significantly change in the three years following PLC at Work® process implementation. Rather than indicating a lack of effect, this stability suggests that schools already operating with strong retention remain steady during and after the adoption of these new structures.

This alone is a positive outcome in a period when statewide turnover has risen.
Upon further examination, more nuanced patterns emerge when examining turnover by teacher effectiveness. Highly effective teachers became increasingly likely to remain in Model PLC at Work® schools following implementation, while lower-effective teachers show modest increases in turnover.

This selective retention pattern strengthens overall instructional capacity by keeping the teachers most associated with improved student outcomes. Results also differ by school level, with elementary campuses showing trends toward greater stability and high schools trending toward higher turnover. These differences may reflect variations in organizational culture or workload pressures that shape how PLC practices translate into teacher retention.

Taken together, these findings highlight that the PLC at Work® process supports workforce stability by helping schools retain highly effective teachers and sustain already strong retention levels. For practitioners and district leaders, the results point to the importance of investing in conditions that promote long-term teacher commitment such as collaboration time, shared accountability, and professional growth opportunities.

4.7 Recommendations

Recommendations for Solution Tree

1. Develop Retention-Focused Professional Development Sessions: Create training that equips leaders to address teacher satisfaction, burnout, and career growth aimed at increasing retention and building teacher leaders.
2. Offer Leadership Training on Retention Strategies: Provide principals and district leaders with targeted guidance on how to use the PLC at Work® process to retain high-performing teachers, distribute leadership opportunities, and build long-term workforce stability through establishing effective guiding coalitions and other shared leadership models.
3. Target High School Contexts: Design specialized supports for high schools, where turnover patterns diverge from elementary levels. This could include guidance for scheduling, supporting singleton high school teachers, and working specifically with teachers whose courses have End of Course assessments.
4. Expand Research on Retention Mechanisms: Invest in follow-up research (quantitative and qualitative) to better understand how the PLC at Work® process implementation affects teacher satisfaction, school culture, and long-term retention trends.

Recommendations for Practitioners and Leaders

1. Prioritize Protected Collaboration Time: Ensure master schedules consistently carve out meaningful, uninterrupted time for teams to reflect on practice, discuss data, and support teacher well-being.
2. Teacher Career Pathways: Use collaborative structures to build opportunities for teacher leadership, mentorship, and recognition, especially for highly effective teachers who are most likely to stay when given responsibility and growth opportunities.
3. Focus Retention Strategies on High School Teams: Adjust the PLC at Work® process to account for high school scheduling and course demands such as implementing cross-department collaboration or structured support for singleton teachers.

4. Track Data to Monitor Retention Trends: Districts should track teacher retention by effectiveness, subject, and school level to understand how the PLC at Work® process structures may be shaping workforce stability and to guide resource allocation.

Section 5. Conclusion and Recommendations

This section brings together the findings from earlier sections to provide a coherent understanding of how the PLC at Work® process supports student learning, teacher retention, and overall school improvement. While Sections 3 and 4 examined student and teacher outcomes separately, this section highlights how these patterns interact to create the organizational conditions necessary for sustained success. We draw connections between achievement gains and workforce stability, provide rationale using the systemic features of the PLC at Work® process that may contribute to these outcomes, and identify key conditions that enable effective implementation. Finally, we consider the broader implications for Texas districts, particularly those not yet participating in the Model PLC at Work® process, and offer recommendations for Solution Tree, district and campus leaders, and policymakers.

5.1 Section Summary

- Aligned Improvements in Student and Teacher Outcomes: Student learning gains and teacher workforce stability reinforce one another in Model PLC at Work® schools. As collaborative structures strengthen, student achievement improves while schools maintain or enhance retention of highly effective teachers.
- The PLC at Work® Process as a Systemic Improvement Model: The PLC at Work® process functions not as a single intervention but as a schoolwide system that builds coherence across instruction, assessment, collaboration, and professional learning. This coherence appears to support sustained gains rather than short-term changes.
- Conditions for Sustained Success: Successful implementation is supported by protected collaboration time, strong leadership teams, clear expectations for data use, and organizational readiness.
- School Improvement Implications: Findings suggest that the PLC at Work® process can contribute to continuous improvement in diverse school contexts and across historically underserved student subgroups.

5.2 Connecting Student and Teacher Outcomes

The student and teacher findings reveal several intersecting patterns that help explain how the PLC at Work® process supports improved academic outcomes. Rather than independent results, the two analyses point to a shared understanding of school improvement mechanisms. Specifically, schools that maintain a stable, high-capacity teaching workforce are in a better position to implement collaborative practices that drive student learning gains.

First, the timing of effects aligns across both outcomes. Student achievement gains emerge gradually and become most pronounced in Years 2 and 3 of implementation. This is the same period during which retention patterns begin to strengthen. This finding suggests that as the PLC at Work® process structures mature, schools retain more of their highly effective teachers while lower-effective teachers exit at slightly higher rates. Over time, this shift raises the overall instructional capacity of grade-level and departmental teams, reinforcing the collaborative routines that support sustained student growth.

Second, workforce stability appears to be a foundational condition for the student gains observed. Model PLC at Work® schools enter implementation with lower turnover and a higher proportion of traditionally certified teachers than the statewide average. As turnover stabilizes across multiple years of implementation, this allows for collaborative inquiry cycles, common assessment practices, and data-driven adjustments to take root. The fact that student gains materialize only after multiple years is consistent with an environment where teams stay together long enough to deepen their practice.

Third, the strongest student gains occur for economically disadvantaged students and English Learners. Typically, campuses that serve large numbers of these populations have higher turnover. Yet Model PLC at Work® schools maintain stable staffing patterns. This suggests that the PLC at Work® process may help create a more supportive instructional environment that not only increases student learning but also improves teacher retention.

Together, these connections point to a reinforcing cycle: stable, increasingly effective teacher teams that support stronger student learning, and the collaborative structures that improve student outcomes simultaneously strengthen teacher engagement, professional identity, and retention. This reciprocal relationship illustrates how the PLC at Work® process functions not simply as a professional development initiative but as a system of school-level improvement that enhances both student and teacher outcomes over time.

5.3 The PLC at Work® Process as Systemic Improvement

The combined student and teacher results point to the PLC at Work® process functioning not as a collection of discrete practices, but as a system of improvement that aligns structures, professional routines, and instructional decision-making. The three big ideas of the PLC at Work® process - an emphasis on collaboration, learning, and results - contribute to this system-level coherence.

A central feature of the PLC at Work® process is the way that it embeds collaboration into the core operating rhythm of the school. By structuring recurring cycles of planning, assessment, and response, the model shifts collaboration from simply scheduling lessons to creating shared responsibility for student learning. This systematic approach ensures that individual teacher practice is continuously informed by team-based analysis of evidence, which helps explain the gradual but sustained improvements in student outcomes observed in later implementation years.

Equally important is the model's emphasis on collective ownership of results. Teams use common assessments, shared learning targets, and aligned interventions, which reduce variability in instructional quality across classrooms. This collective orientation supports instructional coherence, which is a key factor in both organizational learning and site-based school improvement. As teams internalize the four critical questions of the PLC at Work® process, decision-making becomes more consistent, more responsive, and more focused on student learning needs.

The PLC at Work® process also strengthens the school's human capital system. Collaborative structures create clearer expectations for instructional practice, provide ongoing professional learning with teams, and distribute leadership across the campus. This creates a working environment that is more likely to retain highly effective teachers and reinforce a culture of continuous improvement. The selective retention patterns observed in Section 4 align with this mechanism. As structures mature, schools not only retain their strongest teachers but create an environment that encourages shared expertise and instructional refinement.

Finally, the PLC at Work® process supports equitable improvement by establishing routines that help identify and respond to gaps for student groups traditionally underserved in statewide accountability systems. These patterns are consistent with a system that prioritizes early identification of learning gaps, coordinated interventions, and team-based problem solving. These features indicate that the PLC at Work® process operates as a systemic improvement strategy. It is one that aligns people, processes, and instructional practices over multiple years to build a more coherent and effective school ecosystem. The consistency of effects across student groups, grade spans, and teacher outcomes further illustrates the extent to which the PLC at Work® process functions as an organizational framework rather than a single programmatic initiative.

5.4 Broader Implications for Texas and Beyond

5.4.1 For Districts Considering the PLC at Work® Process

The findings in this report offer several insights for districts considering adoption of the PLC at Work® process. First, the multi-year pattern of student achievement gains, particularly in the second and third year of implementation, signals that the process is most effective when districts commit to sustained implementation rather than short-cycle initiatives. The gradual strengthening of teacher retention, especially among highly effective educators, suggests that stable staffing conditions can amplify the benefits of collaborative routines. Districts with existing protected collaboration time, experienced teaching teams, or strong instructional leadership may experience a smoother transition and earlier gains. At the same time, the observed effects for economically disadvantaged students and English Learners indicate that the process can support improvement efforts in schools serving diverse populations, provided teams have structures that help them respond to student needs. For districts exploring models of shared accountability, data-driven instructional decision-making, and team-based improvement, the PLC at Work® process provides a coherent framework with demonstrated benefits.

5.4.2 For Texas Statewide Strategy

At the state level, these results align with several ongoing Texas priorities, including improving teacher retention, supporting underserved student subgroups, and promoting high-quality instructional materials and research-based instructional strategies. The strong performance of English Learners and economically disadvantaged students in Model PLC at Work® schools suggests that the process may complement existing statewide efforts focused on closing achievement gaps. The stability of teacher retention, despite rising statewide turnover, further supports Texas's focus on workforce sustainability. The uneven geographic distribution of Model PLC at Work® schools, especially where these two student populations are greatest, highlights opportunities for strategic expansion. TEA and regional education service centers could leverage these findings to identify regions where the PLC at Work® process would be most impactful, expanding access to a model that has demonstrated effectiveness.

5.4.3 For National Research and Reform Efforts

Although the analyses in this report draw on Texas data, the patterns mirror broader national conversations around collaborative professional learning systems. Texas is one of the most demographically, linguistically, and geographically diverse public education systems in the nation, serving large urban districts, rapidly growing suburban regions, and extensive rural areas. This diversity provides a strong testbed for examining whether a school improvement model can work across varied contexts and student populations. The delayed but consistent improvements in student achievement observed reinforce existing national research showing that instructional collaboration influences student outcomes when embedded as an ongoing practice rather than a short-term initiative. Likewise, the evidence of teacher retention, where highly effective teachers are more likely to remain in a Model PLC at Work® school, extends existing research on how professional learning structures and school culture shape workforce stability. These patterns suggest that the PLC at Work® process may offer a scalable improvement framework for states seeking models that support both instructional quality and teacher retention across diverse schooling environments.

References

Bailey, K., & Jakicic, C. (2023). *Common Formative Assessment* (2nd ed.). Solution Tree.

Black, P., & Wiliam, D. (2009). Developing the theory of formative assessment. *Educational Assessment, Evaluation and Accountability*, *21*(1), 5–31. http://dx.doi.org.lib-e2.lib.ttu.edu/10.1007/s11092-008-9068-5

Buchanan, J., Prescott, A., Schuck, S., Aubusson, P., & Burke, P. (2013). Teacher retention and attrition: Views of early career teachers. *Australian Journal of Teacher Education (Online)*, *38*(3), 124–141. https://doi.org/10.3316/informit.705789501923965

Callaway, B., & Sant'Anna, P. H. C. (2021). Difference-in-Differences with multiple time periods. *Journal of Econometrics*, *225*(2), 200–230. https://doi.org/10.1016/j.jeconom.2020.12.001

Darling-Hammond, L., Holtzman, D. J., Gatlin, S. J., & Vasquez Heilig, J. (2005). Does teacher preparation matter? Evidence about teacher certification, Teach for America, and teacher effectiveness. *Education Policy Analysis Archives*, *13*, 42. https://doi.org/10.14507/epaa.v13n42.2005

DuFour, R., DuFour, R., Eaker, R., Many, T., Mattos, M., & Muhammad, A. (2024). *Learning by Doing* (4th ed.). Solution Tree.

Gore, J., & Rosser, B. (2022). Beyond content-focused professional development: Powerful professional learning through genuine learning communities across grades and subjects. *Professional Development in Education*, *48*(2), 218–232. https://doi.org/10.1080/19415257.2020.1725904

Kirksey, J. J. (2025). *The Economic Benefits of High-Quality Teacher Preparation in Texas*. Texas Tech University. https://hdl.handle.net/2346/101225

Kirksey, J. J., & Gottlieb, J. (2024). *Teacher preparation in the wild west: The impact of fully online teacher preparation and uncertified teachers in Texas*. Texas Tech University.

May, P. B., Katsinas, S. G., & Moore, L. (2003). Alternative teacher certification programs and Texas community colleges. *New Directions for Community Colleges*, *121*, 67–78. https://doi.org/10.1002/cc.101

Solution Tree. (n.d.). *Model PLC at Work™ – AllThingsPLC*. Model PLC at Work. Retrieved December 16, 2024, from https://allthingsplc.info/model-plc-at-work/

Tournaki, N., Lyublinska, I., & Carolan, B. (2009). Pathways to teacher certification: Does it really matter when it comes to efficacy and effectiveness?: Action in teacher education. *Action in Teacher Education*, *30*(4), 96–109.

Appendix

A.1 Data

This study uses administrative data accessed through the University of Houston Education Research Center (UH-ERC), which maintains secure, de-identified, and longitudinally linked records on all students enrolled in Texas public schools. The dataset includes student-level demographics, STAAR achievement results, school and district characteristics, and teacher employment and certification information supplied by the Texas Education Agency and the State Board for Educator Certification (SBEC). We constructed a longitudinal panel of students enrolled in Model PLC at Work® schools and a matched comparison group of students in non-designated campuses. For the teacher retention analysis, we create a teacher-level panel dataset that includes employment records, teacher demographic and certification information, and demographic and achievement characteristics of students. Our final sample includes over 86,422 teacher-year observations across 24 campuses, spanning elementary, middle, and high school settings. Campuses with a formal designation as a Model PLC at Work® school were identified through publicly available listings maintained by Solution Tree on their AllThingsPLC.info website.

Table A1. Descriptive Statistics for Students in Model PLC at Work® School by Designation Year

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
Male	0.52	0.51	0.51	0.51	0.51	0.51	0.52	0.51	0.51	0.51	0.51
Black	0.12	0.12	0.12	0.12	0.12	0.13	0.13	0.13	0.14	0.14	0.12
American Indian	0.14	0.13	0.11	0.11	0.10	0.08	0.07	0.07	0.07	0.06	0.11
Asian	0.07	0.08	0.08	0.09	0.09	0.09	0.09	0.09	0.09	0.10	0.08
Hawaiian	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hispanic	0.40	0.40	0.41	0.41	0.41	0.41	0.42	0.43	0.43	0.43	0.41
Limited English Proficiency	0.17	0.17	0.17	0.17	0.17	0.17	0.19	0.20	0.22	0.23	0.19
Enrolled in an ESL Program	0.15	0.16	0.17	0.17	0.18	0.19	0.20	0.22	0.25	0.27	0.19
Enrolled in a Bilingual Program	0.35	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.37	0.36
Immigrant Status	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.04	0.04	0.03
Migrant Status	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Economically Disadvantaged	0.45	0.45	0.46	0.47	0.47	0.50	0.51	0.51	0.52	0.52	0.48
Gifted and Talented	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.08	0.08	0.08	0.07
Special Education	0.08	0.09	0.09	0.09	0.09	0.11	0.10	0.12	0.13	0.15	0.11
504 Indicator	X	X	X	X	0.06	0.06	0.06	0.06	0.06	0.06	0.06
At Risk Indicator	0.42	0.41	0.40	0.41	0.41	0.41	0.42	0.45	0.45	0.45	0.41
Observations	3	1	1	2	8	13	6	27	41	17	117

A.2 Analytic Sample

The student analytic sample includes all tested students enrolled in Model PLC at Work® schools between 2015 and 2024, along with a matched comparison group of students in non-designated campuses. Students are included in all years in which they have valid STAAR scores and demographic records.

The teacher analytic sample includes all teachers employed in Model PLC at Work® schools and matched comparison schools during 2015 and 2023. Teachers are included in every year they appear in SBEC employment files, with turnover defined as exiting the district or Texas public schools system in the subsequent year.

A.3 Empirical Approach

Section 3 Student Outcomes

To determine the relationship between attendance in Model PLC at Work® schools and student outcomes we estimate the impact of the PLC at Work® process on student achievement. To do so, we employ a staggered difference-in-differences (DiD) framework that exploits variation in the timing of Model PLC at Work® school designation across Texas campuses. While all schools must demonstrate at least three years of student achievement growth and a commitment to the PLC at Work® process to receive the designation, schools adopt and apply for Model PLC at Work® school status at different times. This variation in application timing allows us to compare trends in student achievement between schools that applied for designation in different years and those that never received the designation.

Our identification strategy follows the estimator proposed by Callaway and Sant'Anna (2021), which improves upon traditional two-way fixed effects models in the presence of treatment effect heterogeneity and staggered treatment adoption. Formally, we estimate average treatment effects on the treated (ATT) for each treatment cohort and post-treatment year. These estimates are aggregated to obtain overall average effects while preserving the integrity of comparisons across cohorts. Our primary specification estimates the effect of Model PLC at Work® school designation on standardized STAAR scale scores in reading and math, using grade-by-year standardized achievement as the dependent variable.

We include student, teacher, and school-level covariates as described above, and we cluster standard errors at the school level to account for serial correlation and within-school dependence over time. To ensure identification is driven by within-school changes, we restrict comparisons to traditional public schools and adjust for differential trends in prior achievement. In supplementary models, we explore dynamic treatment effects by year since implementation to assess whether the impact of the PLC model strengthens over time—a key theoretical premise of the PLC at Work® framework.

$$Y_{istg} = \alpha + \sum_{e \in \mathcal{E}} \sum_{l \in \mathcal{L}} \tau_{el} \cdot \mathbb{1}(E_i = e, T_{it} = l) + X'_{istg}\beta + \mu_s + \gamma_g + \delta_t + \varepsilon_{istg}$$

In this specification, Y_{istg} represents the standardized achievement score for student *i*, in school *s*, at time *t*, and in grade *g*. The primary parameters of interest are τ_{el}, which denotes the average treatment effect for cohort *e* in relative time period *l* (i.e., *l* years since PLC implementation). These parameters are estimated using the approach developed by Callaway and Sant'Anna (2021), which identifies group-time average treatment effects in settings with staggered adoption and treatment effect heterogeneity. The term $1\left(E_i = e, T_{it} = l\right)$ is an indicator function equal to 1 if the observation belongs to treatment cohort *e* and is observed *l* years after adoption, and 0 otherwise. The set E includes all treatment cohorts, and L defines the set of relative time periods considered in the estimation.

We add μ_s, a fixed effect for school *s*, to account for time-invariant school-level characteristics that may influence student achievement. By including school fixed effects, we ensure that identification of τ_{el} , the effect of PLC implementation *l* years after adoption for cohort *e*, comes exclusively from within-school changes over time. School fixed effects account for omitted variable bias stemming from persistent differences across campuses that could be correlated with both PLC implementation and student outcomes. The vector X'_{istg} includes student-, classroom-, teacher-, and school-level covariates. The coefficients on these covariates are captured by the parameter vector β. Grade fixed effects γ_g and year fixed effects δ_t are included to absorb variation in achievement across grades and over time. The error term ε_{istg} captures unobserved determinants of achievement. Standard errors are clustered at the school level. To identify dynamic treatment effects, we omit the year immediately prior to PLC implementation as the reference period and estimate effects relative to that baseline. Non-designated schools serve as the comparison group for all cohort-year combinations.

Section 4 Teacher Retention

In the same manner,we apply a staggered difference-in-differences (DiD) framework that exploits variation in the timing of Model PLC at Work® School designation across Texas campuses to estimate the impact of the PLC at Work® process on teacher turnover. Because schools must demonstrate at least three years of documented student achievement growth and sustained engagement to the PLC at Work® process to receive the designation, schools adopt and apply for Model PLC at Work® School status at different times. This staggered adoption provides a natural opportunity to compare changes in turnover rates among schools that achieved recognition in different years.

We implement interaction-weighted event-study estimators, which report effects in event-time relative to each campus's adoption year. All models include campus and year fixed effects, controlling for time-invariant campus characteristics and statewide unobserved heterogeneity. We include student, teacher, and school-level covariates as described above, and we cluster standard errors at the school level to account for serial correlation and within-school dependence over time. To ensure identification is driven by within-school changes, we restrict comparisons to traditional public schools and adjust for differential trends in prior achievement. In supplementary models, we explore dynamic treatment effects by year since implementation to assess whether the impact of the PLC model strengthens over time.

The empirical specification is expressed as follows:

$$Y_{icdt} = \sum_{\tau \neq -1} \beta_{\tau} 1\{EventTime = \tau\}_{ct} + \gamma X_{ct} + \delta Z_{it} + \mu_{c} + \lambda_{t} + \varepsilon_{icdt}$$

Where Y_{icdt} represents the likelihood of turnover for teacher *i* in campus *c* in district d at time *t*; X_{ct} denotes campus- and district-level time-varying covariates; Z_{it} represents teacher-level characteristics; and, μ_{c} and λ_{t} are campus and year fixed effects. The event-time coefficients β_{τ} are estimated via campus cohort-specific differences in turnover rates.

Outcomes

Our outcome of interest for this study is teacher turnover. We define teacher turnover as a binary outcome indicating whether a teacher exits their district or the Texas public school system in the subsequent year. This definition captures both inter-district mobility and attrition from the profession. Teachers who remain in the same district, regardless of school assignment, are considered retained. This definition aligns with TEA's statewide reporting conventions and allows for a meaningful comparison across settings and years.

The treatment of interest is the adoption of the Model PLC at Work® process at the campus level. We identify campuses by designation year and categorize them in yearly cohorts beginning in 2018–19. Treatment is defined at the campus level and operationalized as the first year in which a school formally joins the Model PLC at Work® cohort, based on records publicly available and maintained by Solution Tree. This staggered design enables the use of event-study methods that account for varying treatment timing across campuses.

In the main specification, the model accounts for factors at the teacher, campus, and district levels that could confound the observed relationship between teacher turnover with campus- and district-specific characteristics. Teacher characteristics include race/ethnicity, sex, years of experience, and initial certification pathway (e.g., university-based). Campus- and district-level covariates include student composition based on demographic factors of race/ethnicity, economically disadvantaged status, emergent bilingual status, and disability status. We also include controls for average class size.

Consistent with recent research (Kirksey, 2025; Kirksey & Gottlieb, 2024), we classify certification into seven categories based on the teacher's route into the profession. These include: (1) traditional undergraduate university programs; (2) online programs with minimal in-person training and limited mentorship; (3) university-based alternative programs; (4) programs operated by local education agencies or regional Education Service Centers; (5) other postbaccalaureate alternative programs, including nonprofit residencies and other non-university providers; (6) out-of-state certification programs; and (7) uncertified teachers who lack any formal certification and typically serve under waivers or exemption policies. Those teachers who received their teaching certification through a traditional university route serve as the reference group.

Visual Interpretation

Graphs within Section 3 and 4 that show the estimated effects of the PLC at Work® process, measured in standard deviations. The x-axis represents time in years, with "Year 3" indicating the year a school received Model PLC at Work® designation, and "Year 0" indicating the start of the three-year window of data collection. This timeline reflects program guidelines requiring schools to implement the PLC at Work® process for at least three years prior to applying for designation.

The y-axis shows the estimated effect on student achievement. Positive values above the horizontal line indicate improved performance and negative values below indicate declines. The vertical lines represent error bars, which show the range of uncertainty around each estimate. If an error bar crosses the y-axis (horizontal zero line), the estimate is not statistically significant. Interpreting these graphs involves looking for clear,upward trends with non-overlapping error bars that remain above zero which would indicate a statistically significant positive effect on student achievement.

We report the estimated treatment effect on student achievement in both standard deviations (SD) and months of additional learning. Standard deviations provide a consistent statistical metric for evaluation differences in student achievement across groups and time. To enhance practical relevance for school leaders and practitioners, we convert SD effects to months of learning gained using established benchmarks in education research, where 0.25 SD is commonly interpreted as equivalent to one year (10 months) of academic progress.