APPLIED RESEARCH CENTER

Research Brief

July 2024

Driving School Improvement with a Tool That Predicts Student Achievement

Findings from a district of 53 schools that used the Rigor Appraisal

1-866-731-1999 | InstructionalEmpowerment.com

Table of Contents

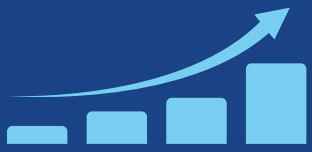
Introduction

This research brief draws from a study conducted by the Instructional Empowerment Applied Research Center in a large urban school district (Basileo et al., 2024). The study focused on the predictive capabilities of the Rigor Appraisal, which is a non-evaluative tool that measures the effectiveness of instructional systems in schools. This brief provides recommendations on harnessing data to drive school improvement, details the rigorous methodologies behind the study, and highlights significant findings.

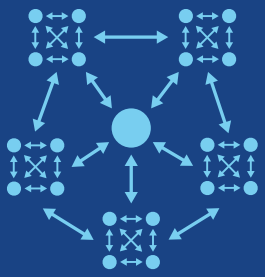
What sets this brief apart is its validation of the Rigor Appraisal's ability to measure academic rigor and confidently predict student outcomes. Leaders can use the tool to not only predict student achievement without additional testing, but also predict student attendance, behavior, and school culture – across various groups of student demographics. Notably, schools that conducted more classroom walks and engaged in more coaching days around the tool with education services provider Instructional Empowerment saw greater gains in student achievement. Those with score increases in the area of student-led teaming structures saw impacts that were even greater for students from low socioeconomic backgrounds.

With these insights in hand, education leaders have a powerful instrument in the Rigor Appraisal. They can prioritize the most effective instructional practices, achieve measurable, long-term outcomes for their students, and make meaningful strides in eliminating opportunity gaps once and for all.

Summary of Findings:
The Rigor Appraisal Is Predictive of School Improvement



Rigor Appraisal scores were positively and significantly associated with increased student achievement.



A rigorous causation model that goes beyond correlation found that score increases on one pillar of the Rigor Appraisal (Activating Student Teams to Achieve the Standard) predicted higher ELA achievement.

The impact was even greater for students from low socioeconomic backgrounds.

Score increases on the Rigor Appraisal were positively and significantly associated with decreased student behavior referrals and suspensions, increased student attendance, and improved school culture.

The more coaching days from Instructional Empowerment that a school received as part of the Rigor Appraisal and school improvement process, the more their student achievement increased.

The more Rigor Classroom Walks a school completed, the more their student achievement increased.

Rigor Appraisal's impact and predictive power was strong even through the pandemic.

About the Study

Rigorous Study Design

A study was conducted to determine whether the Rigor Appraisal provides leading indicator data of academic achievement (Basileo et al., 2024). It represents one study in a series of studies to assess the predictability of the tool. This research brief summarizes the findings from that study.

The study examined Rigor Appraisal results across 48-53 schools in one district (the number of schools varied slightly for each item that was measured). Third-party certified scorers completed three Rigor Appraisals per school building during the school year. The certification process for the third-party scorers included a 6-hour training course, practice scoring sessions, calibration sessions in schools to test scorer accuracy, supervision and support for new scorers from experienced lead scorers, and a certification assessment after completing the training.

During the Rigor Appraisals, the scorer met onsite with the principal and school leadership team. They jointly scored at least 10 randomly selected classrooms to ensure the accuracy of schoolwide trends. Afterwards, they debriefed on their observations, identified baseline conditions, and determined the next steps for school improvement. Teachers remained anonymous, as scores were non-evaluative (not a part of teachers' annual professional evaluation), and no teacher-identifying information was gathered.

Statistical Significance of Results

Statistical significance refers to the probability that a result or relationship observed in a sample reflects a real effect in the population rather than just being due to chance. It helps determine whether the results of a study or experiment are reliable and meaningful, or simply due to random variation.

This study looked at three levels of statistical significance:

Very Strong	**0.01**

This represents a 1% chance the result is due to chance. That means the evidence is very strong and can be considered highly significant.

Strong	**0.05**

This represents a 5% chance the result is due to chance. That means the evidence is strong and can be considered significant. This is the most commonly used cutoff for statistical significance.

Approaching	**0.10**

This represents a 10% chance the result is due to chance. That means the evidence is approaching the high bar set for statistical significance.

How Schools Used the Rigor Appraisal

The school district that participated in the study incorporated the Rigor Appraisal as part of Instructional Empowerment's school improvement services, which also includes coaching and professional development.

The tool provided a way to identify systems-based root causes that needed to be addressed, measure instructional improvement as the district implemented the Model of Instruction for Deeper Learning, and empower leaders while building capacity for data-driven school improvement.

Identifying Systems-Based Root Causes

Research says that if any of the systems in schools are dysfunctional, the performance of the entire school is degraded (Shindler et al., 2016). The district in this study used the Rigor Appraisal to identify the systems-based root causes holding schools back. Instructional Empowerment's expert coaches then worked with the schools, using the aggregated results from Rigor Appraisals to guide the school leadership team in co-developing a plan of action tailored to their school's specific needs. The study found that the more coaching days schools received, the higher the student achievement.

Measuring Improvement While Implementing a Model of Instruction

The district in this study implemented Instructional Empowerment's Model of Instruction for Deeper Learning as part of the school improvement services. The model is designed to build students' agency through collaborative teaming structures that develop their ability to self-direct their own learning. The model increases academic rigor in classrooms, which the Rigor Appraisal is designed to measure. One of the study findings was that student teaming, through the Model of Instruction for Deeper Learning, significantly impacted achievement, especially for students from low socioeconomic backgrounds.

Empowering Leaders and Building Their Capacity

To build the internal capacity of the schools and district, school leadership teams received training to conduct instructional classroom walks (Rigor Classroom Walks) that could be used on a more frequent basis, between the quarterly Rigor Appraisals. Leaders were able to use the Rigor Classroom Walk data to drive timely, informed adjustments and stay on track to reach goals for student outcomes.

About the School District That Participated in the Study

The study examined one 53-school district in Illinois that serves a diverse student population. The district used the Rigor Appraisal in the 2021-22 school year.

Approximately

35,000 Students

46.4% Students from Low Socioeconomic Backgrounds

39.1% English Learners

18.6% Students with Disabilities

Individual schools in the study served student populations with up to ...

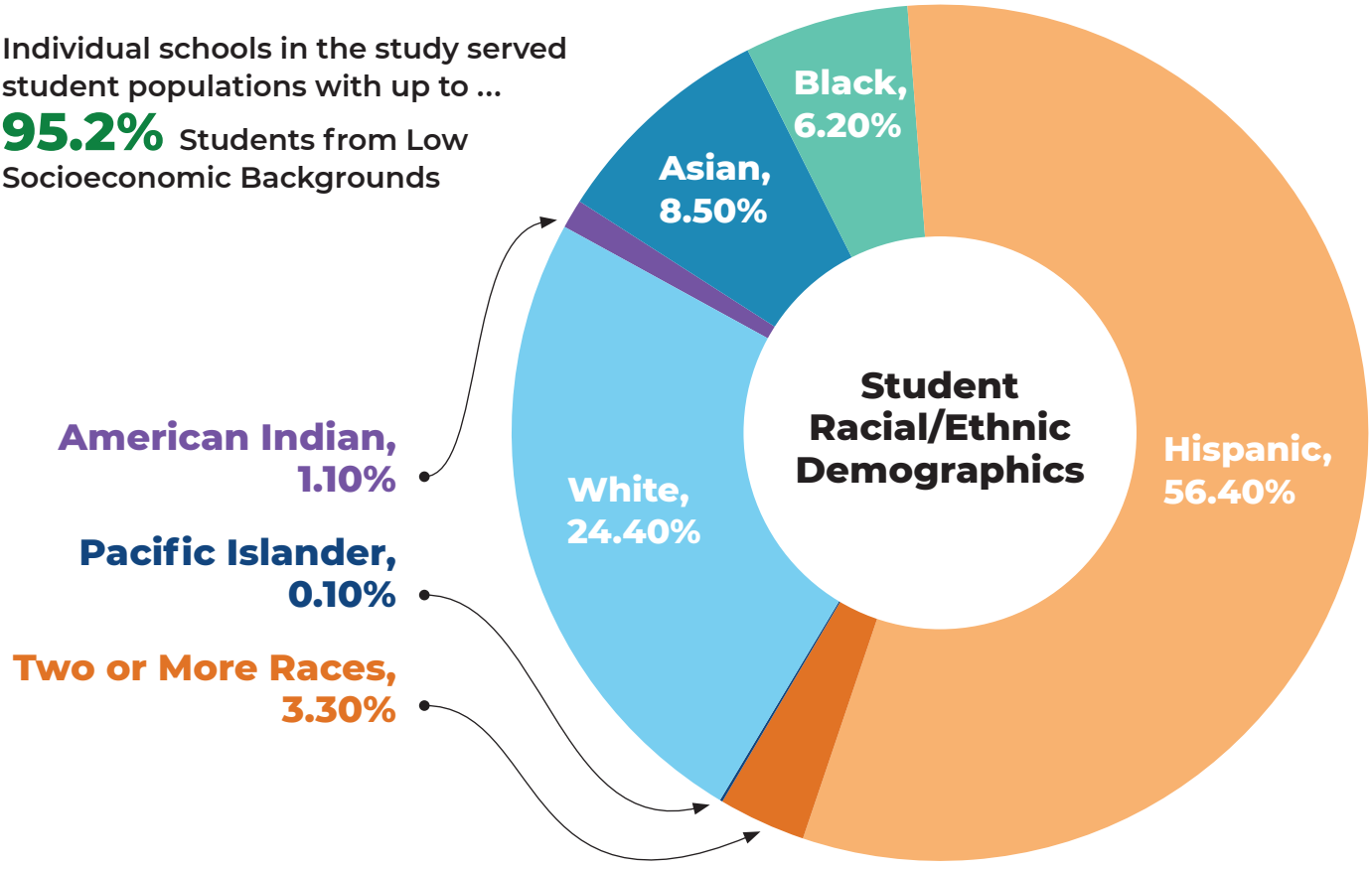
95.2% Students from Low Socioeconomic Backgrounds

53 Schools

19% ELA Proficiency

19% Math Proficiency

45% Science Proficiency



Illinois State Board of Education (2022)

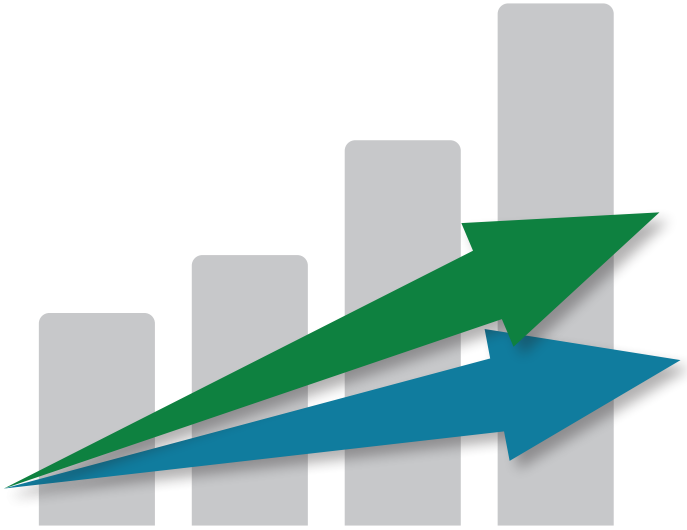
APPLIED RESEARCH CENTER

Detailed Findings

1-866-731-1999 | InstructionalEmpowerment.com

Student Achievement Increased as Rigor Appraisal Scores Increased

As Rigor Appraisal scores increased, so did ELA and math learning rates. The evidence had very strong statistical significance for ELA and was approaching statistical significance for math. This means that districts can use Rigor Appraisal scores to reliably predict student achievement before the state assessment and make adjustments as needed.



ELA Achievement

.388

Very Strong Statistical Significance

Math Achievement

.267

Approaching Statistical Significance

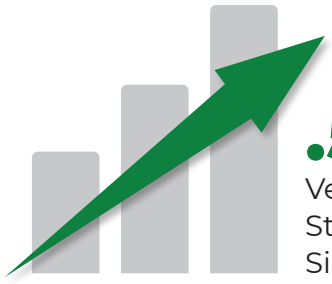
Student-Led Teaming Significantly Impacted Achievement – Especially for Students from Low Socioeconomic Backgrounds

Using a rigorous causation model that goes beyond correlation and controls for other variables that impact student achievement, the study found that regardless of student demographic factors (students from low socioeconomic backgrounds and students with disabilities), score increases on the Activating Student Teams to Achieve the Standard pillar in the Rigor Appraisal predicted score increases on ELA achievement on the state assessment. The impact was even greater for students from low socioeconomic backgrounds.

Student-led teaming had a statistically significant impact on ELA achievement for schools in the study ...

.486
Very Strong Statistical Significance

... and student-led teaming had an *even greater* impact for schools with higher percentages of students from low socioeconomic backgrounds, with as many as 95.2% of students from low socioeconomic backgrounds.



.501
Very Strong Statistical Significance

What is Student-Led Teaming?

Instructional Empowerment's Model of Instruction for Deeper Learning centers on student-led teaming, which involves students organized into small teams with clear protocols for engaging in rigorous standards-based academic work, as defined in the book *The Power of Student Teams: Achieving Social, Emotional, and Cognitive Learning in Every Classroom Through Academic Teaming* (Toth & Sousa, 2019).

This model cultivates independent, critical thinking instead of dependent, compliant learning. It builds students' academic agency through structures that develop their ability to self-direct their own learning. Students are empowered with real roles and responsibilities within their team structures and become highly motivated to drive their own learning. Student-led teaming works in all subjects and grade levels K-12.

The many success stories of this model include one Florida school serving a population of 100% students from low socioeconomic backgrounds that raised student academic proficiency and brought their state rating from the lowest to one of the highest in the state (Lakewood Elementary, 2021).

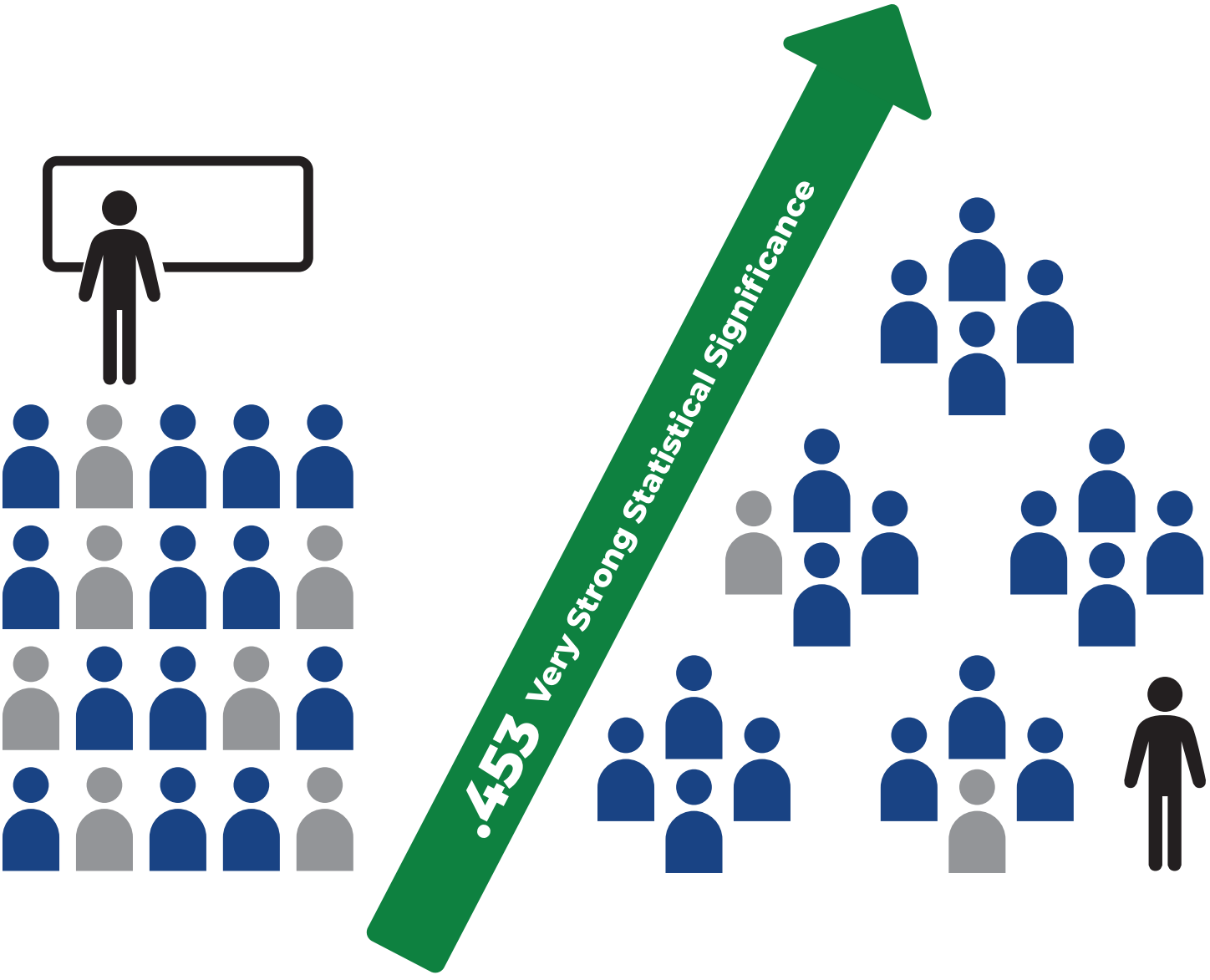
Student Behavior Referrals and Suspensions Decreased as Rigor Appraisal Scores Increased

As schools increased their scores on the Rigor Appraisal, they saw decreased rates of student behavior referrals and suspensions and the findings were statistically significant. These measures were significant at one of the highest levels possible for social science (-.730 and -.636). A negative number in this context indicates an inverse relationship: as Rigor Appraisal scores increase, student behavior referrals and suspensions decrease.

The results mean that when schools focus on raising their Rigor Appraisal score, improvement in student behavior should follow.

Student Attendance Increased as Rigor Appraisal Scores Increased

As schools increased their scores on the Rigor Appraisal, they saw higher rates of average weekly student attendance and the finding was statistically significant. The results mean that when schools focus on raising their Rigor Appraisal score, improvement in student attendance should follow.



School Culture Measures Increased as Rigor Appraisal Scores Increased

As schools increased their scores on the Rigor Appraisal, they saw higher average 5Essentials scores, and the finding was statistically significant. Since the 5Essentials measures a school's culture and climate, focusing on raising Rigor Appraisal scores should lead to improvement in school culture.

What is the 5Essentials Measurement?

The 5Essentials measures a school's culture and climate across five factors:

1. Effective Leaders
2. Collaborative Teachers
3. Involved Families
4. Supportive Environment
5. Ambitious Instruction

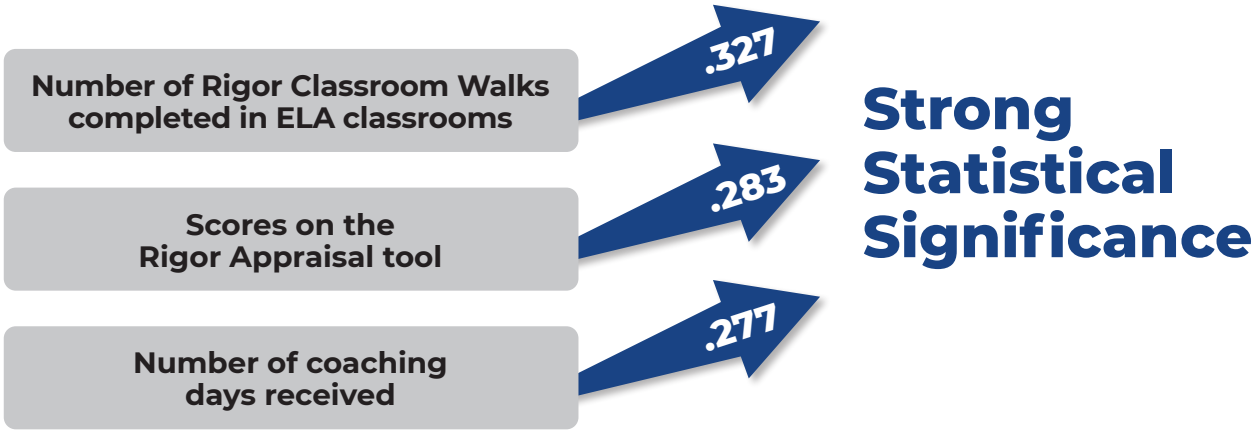
The 5Essentials survey has been administered in over 6,000 schools across 22 states, with over 10 million students, teachers, and parents (UChicago Impact, 2023).

Research shows that the 5Essentials was positively and significantly related to test score gains, attendance rates, GPA, high school graduation rates, and college enrollment (Hart et al., 2020).

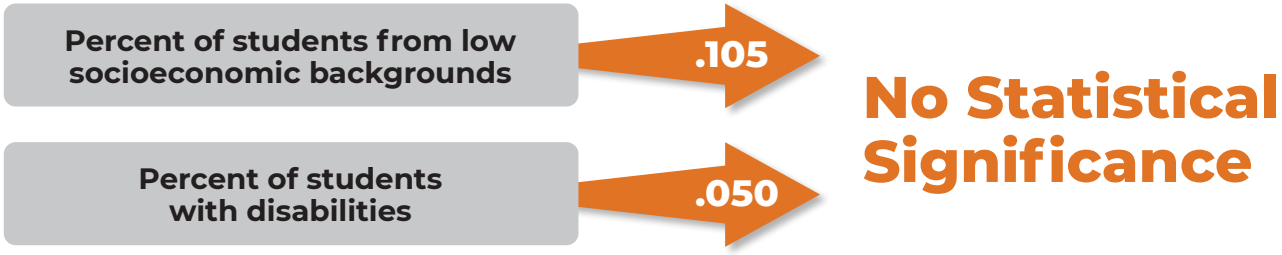
**Instructional Empowerment is not affiliated with the 5Essentials Survey or UChicago Impact.*

Instructional Practices Played a Primary Role in Student Achievement, Regardless of Demographic Differences

The number of Rigor Classroom Walks conducted in ELA classrooms, the Rigor Appraisal score, and the number of coaching days all were statistically significant in influencing the schools' ELA achievement on the state assessment.



It is important to note that the percent of students with disabilities and percent of students from low socioeconomic backgrounds at the schools did not have a statistically significant impact on ELA achievement.



The More Coaching Days, the Higher the Student Achievement

The more leadership and faculty coaching days a school received from Instructional Empowerment, the greater the impact on student achievement in both math and ELA on the state assessment.

The number of coaching days **ranged from 4.5 to 40 per school for the full school year**.

The More Rigor Classroom Walks a School Completed, the Higher the Student Achievement

The more classroom visits that school leadership teams conducted using the Rigor Classroom Walk tool, the greater the association with student achievement in both math and ELA on the state assessment.

The number of classroom walks completed **ranged from 125 to 1,282 for the full school year.**

Rigor Appraisal's Impact and Predictive Power Was Strong Even Through the Pandemic

The Applied Research Center obtained the findings in the study during the 2021-22 school year, which was a time of national decline in student achievement due to the pandemic.

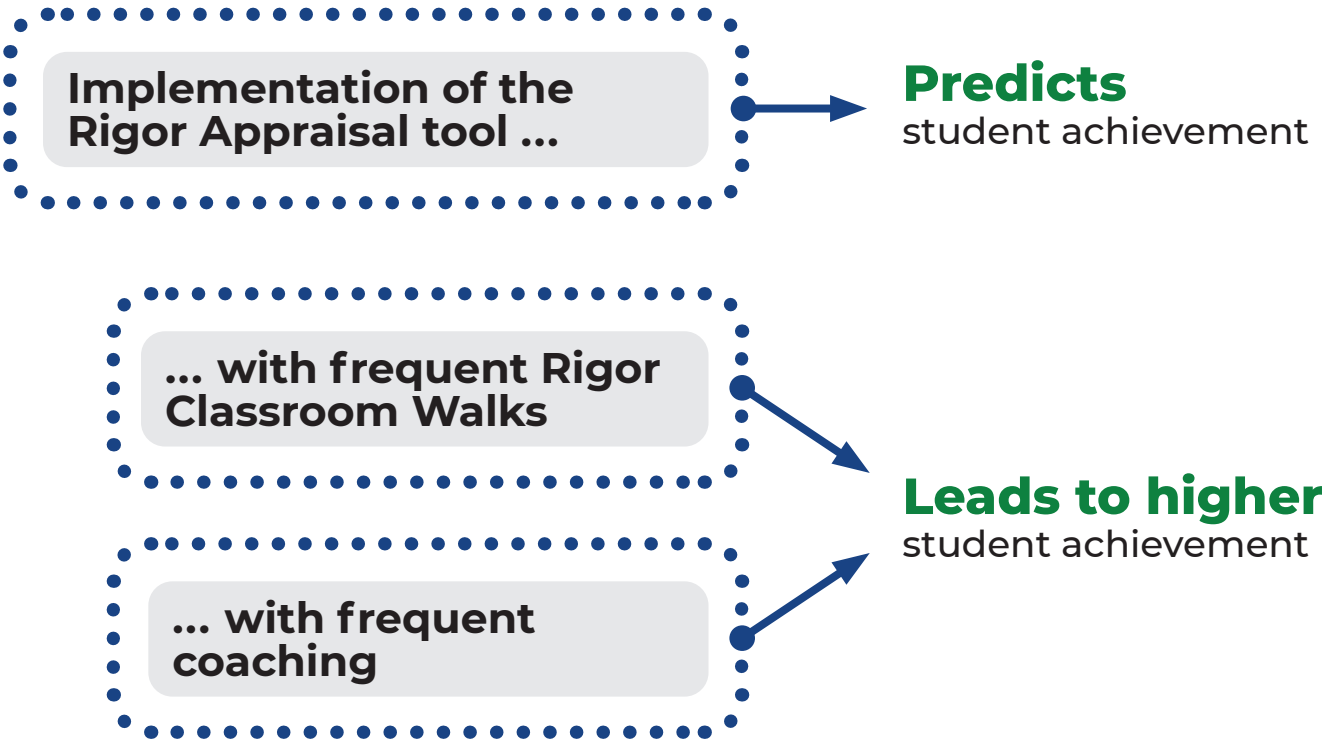
The National Assessment of Educational Progress (NAEP) Long Term Trend assessments of reading and math for nine-year-old students in 2022 revealed the largest average score decline in reading since 1990, and the first ever decline in math scores (National Assessment of Educational Progress, 2022).

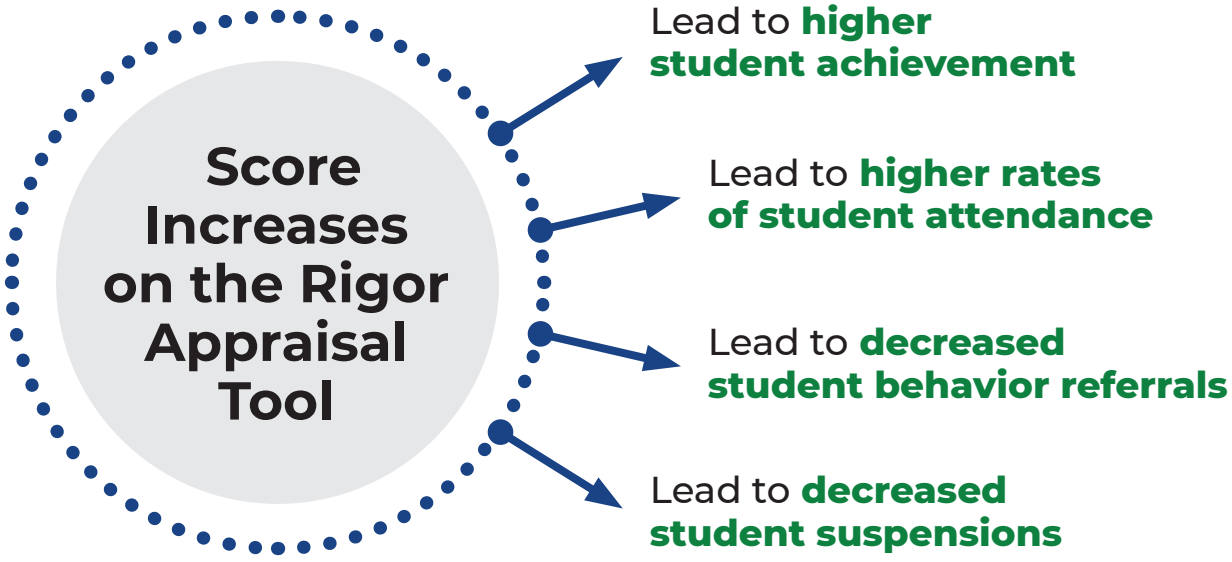
Our analysis of the district that participated in this study showed that **they did not experience the same kind of student achievement regression**.

The Rigor Appraisal process could have **slowed the decline in achievement that occurred elsewhere across the nation** and/or the school improvement services provided to the district by Instructional Empowerment could have caused a positive impact. Because of its use as part of "measurement for improvement" processes that are essential to system transformation (Takahashi et. al., 2020), the Rigor Appraisal provided critical data that were motivating factors for collaborative improvement efforts. These data were closely connected to key processes, timely, and easy to analyze regularly. The data collection and analysis processes were also transparent and built stakeholder trust.

Regardless of the exact cause, **the instrument's predictability remained strong even through the challenging conditions of the pandemic**.

Relationships Between the Findings





4 Research-Based Recommendations to Drive School Improvement

Leaders in elementary and secondary schools need better data and tools for data-driven decision-making to improve the quality of instruction, accelerate learning for all students, and eliminate gaps (Hamilton et al., 2009; Mandinach & Schildkamp, 2021; Marsh et al., 2006). Historically, decision-making in education has narrowly focused on assessment data and has not collected information that would help educators develop students to their fullest potential, identify systems issues within schools, and highlight opportunity gaps (Dodman et al., 2023; Isaacs, 2021; Mandinach & Schildkamp, 2021; Marsh et al., 2006).

We created the Rigor Appraisal Instrument to help leaders inform their decisions with leading indicators to improve instructional systems, track instructional improvements, and provide meaningful feedback to teachers. The following research-based recommendations describe how to identify, select, and use leading indicator data.

1. Identify Leading Indicators to Predict Student Achievement

The data you utilize in your school improvement efforts is critical. In our Applied Research Center's experience with instructional leaders across the country, many lack key leading metrics.

Leading indicators provide early signals that allow educators at the school and district level to predict performance and make strategic and proactive investments of time, effort, and resources to improve student learning (Foley et al., 2008). Leading indicators also inform productive inquiries about conditions and organizational systems that affect the quality of students' educational experiences (Supovitz et al., 2012).

Lagging indicators like large scale standardized assessment scores fail to meet these criteria (May & Sanders, 2013). But many instructional leaders rely heavily on backward-looking, lagging measures to make decisions.

Rigor Appraisal can be an important source of data as it provides a more comprehensive view of the conditions and practices that affect the quality of education that students receive. The study shows that school leaders can use the Rigor Appraisal as a leading indicator of the quality of teaching and student learning, as low scores on the pillars provide actionable areas for improvement without resorting to frequent interruptions of instruction for testing (Basileo et al., 2024). As such, these data could aid in continuous improvement rather than being based on accountability and compliance (Mandinach & Schildkamp, 2021).

2. Ensure the Indicators Are Research-Validated

A strong theoretical and empirical research base is critical when choosing the best data tool to drive school improvement. The **theoretical research basis** ensures that the tool is founded on sound scientific principles. The **empirical evidence** proves that the tool can reliably measure what it was designed to measure when tested in real school settings.

The Rigor Appraisal is the only known classroom walkthrough tool that measures academic rigor, which is defined as an academic culture in the classroom in which there are high expectations for all students to achieve challenging core curriculum standards – content and skills – through engagement and higher-order thinking with autonomy from the teacher (Toth & Sousa, 2019).

The Rigor Appraisal measures five pillars of instruction:

1. Creating Conditions for Learning Rigorous Standards
2. Using Standards-Based Student Evidence
3. Activating Student Teams to Achieve the Standard
4. Verifying Learning to Take Action Within a Lesson
5. Using Data to Track Student Progress Toward Standards

The Rigor Appraisal has an extensive theoretical basis (Basileo et al., 2024) with deep research support for each of the five pillars. The tool has also been rigorously tested in schools nationwide, ranging from those with low state test scores to those with satisfactory scores that seek to optimize the quality and rigor of instruction and student learning.

3. Use Classroom Walks to Measure Progress

Data collection often comes in the form of classroom walkthroughs, which is frequently cited as an essential leadership activity. However, instructional leaders may not be collecting the right data to help them differentiate between high- and low-quality teaching practices and provide actionable feedback to teachers (Boston et al., 2017; Grissom et al., 2013). Instructional leaders must ensure they are collecting **reliable and valid leading indicator data** to drive school improvement, accelerate learning for all students, and eliminate academic performance gaps.

4. Support School Improvement with Expert Coaching and Professional Development

School leaders and their staff often struggle to use data effectively to improve student outcomes. There is little guidance on how leaders can overcome persistent disparities in student outcomes based on race, ethnicity, home language, ability, and socioeconomic status (Ishimaru & Galloway, 2014). The findings of the study on Rigor Appraisal indicate that working with a certified external coach creates an informative collaborative learning environment for leaders. Additionally, providing professional development for teachers on fostering student academic teams may also increase achievement, particularly in schools with lower performance.
By combining coaching and targeted professional learning, schools can turn their data into actionable improvements.

In summary, four critical aspects - leading indicators, research validity, classroom walkthroughs, and expert coaching and professional development - allow leaders to use data to make proactive improvements that enhance achievement, attendance, behavior, and school culture.

About the Instructional Empowerment Applied Research Center

Instructional Empowerment's independent Applied Research Center verifies that every service we provide to our partner schools and districts is evidence-based, impactful, and replicable.

Federally Certified Researcher

Dr. Lindsey Devers Basileo, a What Works Clearinghouse (WWC) Certified Reviewer, leads the Applied Research Center. The WWC is part of the U.S. Department of Education's Institute of Education Sciences and supports educators in finding high-quality research and interventions according to the evidence requirements under the Every Student Succeeds Act (ESSA).

Meeting Evidence-Based ESSA Levels

The Applied Research Center rigorously tests Instructional Empowerment's methods to prove they achieve replicable results in various situations, across various populations of students. Every activity, strategy, and intervention we use has attained or is in the process of attaining criteria for evidence-based practices under the federal Every Student Succeeds Act (ESSA).

Objective, Independent Research with Rigorous Testing

To ensure objective, stringent research protocols, the Applied Research Center operates autonomously and holds the rest of Instructional Empowerment accountable to the highest research standards. We go to the lengths of verifying our results through the Applied Research Center because this work matters to us. We transparently share data with our partners regardless of the findings because trust comes from transparency.

Dr. Lindsey Devers Basileo,

Director of Research
Ph.D. in social science,
2010 Florida State University

Nationally Certified What Works Clearinghouse Reviewer: Group Design Standards (Version 4.0 & 4.1)

Research Specialties:

- Process & Outcome Evaluations (15+ yrs.)
- Experimental & Quasi-experimental Designs (15+ yrs.)
- Qualitative Methods (15+ yrs.)
- Questionnaire Design, Probability Sampling (15+ yrs.)
- Propensity Score Matching (10+ yrs.)
- Hierarchical Linear Modeling (10+ yrs.)

Learn More About the Applied Research Center: https://instructionalempowerment.com/applied-research-center/

References

Basileo, L. D., Lyons, M. E., & Toth, M. D. (2024). Leading indicators of academic achievement: Investigating the predictive validity of an observation instrument in a large district. *Sage Open, 14*(2). https://doi.org/10.1177/21582440241261119

Boston, M. D., Henrick, E. C., Gibbons, L. K, Berebitsky, D., & Colby, G. T. (2017). Investigating how to support principals as instructional leaders in mathematics. *Journal of Research on Leadership Education, 12*(3), 184-214. https://doi.org/10.1177/1942775116640254

Dodman, S. L., DeMulder, E. K., View, J. L., Stribling, S. M., & Brusseau, R. (2023). ''I knew it was a problem before, but did I really?'': Engaging teachers in data use for equity. *Journal of Educational Change, 24*(4), 995–1023. https://doi.org/10.1007/s10833-022-09477-z

Foley, E., Mishook, J., Thompson, J., Kubiak, M., Supovitz, J., & Rhude-Faust, M. K. (2008). *Beyond the test scores: Leading indicators for education*. Annenberg Institute for School Reform at Brown University. http://files.eric.ed.gov/fulltext/ED533117.pdf

Grissom, J. A., Loeb, S., & Master, B. (2013). Effective instructional time use for school leaders: Longitudinal evidence from observations of principals. *Educational Researcher, 42*(8), 433-444. https://doi.org/10.3102/0013189X13510020

Hamilton, L. S., Stecher, B. M., & Yuan, K. (2009). *Standards-based reform in the United States: History, research, and future directions*. https://www.rand.org/pubs/reprints/RP1384.html

Hart, H., Young, C., Chen, A., Zou, A., & Allensworth, E. M. (2020). *Supporting school improvement: Early findings from reexamination of the 5Essentials survey.* University of Chicago Consortium on School Research.

Illinois State Board of Education. (2023). *Illinois report card*. https://www.illinoisreportcard.com/

Isaacs, J. (2021). The problem with data-driven decision making in education. *Journal of Educational Thought, 54*(1), 77–98.

Ishimaru, A. M., & Galloway, M. K. (2014). Beyond individual effectiveness: Conceptualizing organizational leadership for equity. *Leadership and Policy in Schools, 13*(1), 93–146. https://doi.org/10.1080/15700763.2014.890733

Lakewood Elementary: *How this Florida school raised student academic proficiency from the lowest to one of the highest in the state*. (2021). https://instructionalempowerment.com/wp-content/uploads/2023/09/IE01-140-01-S-Lakewood-09-23.pdf

Mandinach, E. B., & Schildkamp, K. (2021). Misconceptions about data-based decision making in education: An exploration of the literature. *Studies in Educational Evaluation, 69*, 100842. https://doi.org/10.1016/j.stueduc.2020.100842

Marsh, J. A., Pane, J. F., & Hamilton, L. S. (2006). *Making sense of data-driven decision making in education: Evidence from recent RAND research*. https://doi.org/10.7249/OP170

May, J. J., & Sanders, E. T. W. (2013). Beyond standardized test scores: An examination of leadership and climate as leading indicators of future success in the transformation of turnaround schools. *Journal of Urban Learning, Teaching, and Research, 9*, 42-54. http://files.eric.ed.gov/fulltext/EJ1028857.pdf

National Assessment of Educational Progress. (2022, September 1). *NAEP long-term trend assessment results: Reading and mathematics*. https://www.nationsreportcard.gov/highlights/ltt/2022/

Shindler, J., Jones, A., Williams, A. D., Taylor, C., & Cardenas, H. (2016). The school climate student achievement connection: If we want achievement gains, we need to begin by improving the climate. *Journal of School Administration Research and Development, 1*(1), 9-16. https://files.eric.ed.gov/fulltext/EJ1158154.pdf

Supovitz, J. A., Foley, E., & Mishook, J. (2012). In search of leading indicators in education. *Education Policy Analysis Archives, 20*(19), 1–27. http://doi.org/10.14507/epaa.v20n19.2012

Takahashi, S., Norman, J., Jackson, K., Ing, M., & Chinen, S. (2020). Measurement for improvement in education. In S. C. Faircloth (Ed.), *Education*. Oxford University Press. https://doi.org/10.1093/obo/9780199756810-0247

Toth, M., & Sousa, D. (2019). *The power of student teams: Achieving the social, emotional, and cognitive learning in every classroom through academic teams.*

UChicago Impact (2023). *5Essentials.* https://uchicagoimpact.org/our-offerings/5essentials

This research brief shares the highlights of a more comprehensive peer-reviewed study published in an open access academic journal. See the full study here:

https://doi.org/10.1177/21582440241261119

Instructional Empowerment's Social Mission

Our social mission is to end generational poverty and eliminate racial achievement gaps through transformed core instruction.

Learn more about Instructional Empowerment's School Improvement Services: InstructionalEmpowerment.com

INSTRUCTIONAL EMPOWERMENT