GREENHOUSE SCHOOLS IN BOSTON

School Leadership Practices
Across a High-Performing Charter Sector

TECHNICAL APPENDIX

INSTRUCTIONAL CULTURE INSIGHT

TNTP developed Instructional Culture Insight (Insight), a teacher-centered survey tool, to assess how school leaders can adjust their leadership practices in order to retain great teachers and improve student learning. Since 2010, TNTP has worked with schools nationwide to understand how the best school leaders manage their teachers and schools. The diagnostic tool, Insight, uses teacher feedback to help leaders understand their instructional leadership practices and improve their school culture in specific, concrete ways.

In any cluster of schools, some leaders are able to build cultures where teachers thrive—successes that can be replicated in other schools if school leaders have access to the right information. Insight gives school leaders that access by asking teachers specific questions about their school's instructional culture and making comparisons to local schools with strong cultures. Teachers are asked standard questions about their school, such as the support teachers have in addressing student misbehavior, the type and frequency of feedback teachers receive from instructional leaders, and the collaboration practices of teachers in their school or district. Based on these responses, we identify schools with strong cultures using the independently validated Insight Index and help leaders break down their school's complex culture into discrete components. This gives principals the clarity they need to build the workplace teachers deserve.

Between 2010 and 2014, TNTP surveyed over 1,125 schools in more than 20 cities, receiving more than 80,000 responses from teachers. Of the schools we surveyed, 78 percent are district schools and 22 percent are charter schools. TNTP administers the Insight survey twice per year—once near the end of a school's first semester and the other near the end of the school year—so that school leaders have information midway through the year, allowing time for course corrections before the end of the year.

INSIGHT INDEX

The Insight Index is a single number based upon the responses of teachers at a particular school to three key items on the Insight survey:

- **Teachers at my school share a common vision of what effective teaching looks like.**
- **At my school, the expectations for effective teaching are clearly defined.**
- **My school is committed to improving my instructional practice.**

To calculate the Insight Index, we take the percent of teachers who agree or strongly agree with each of the above statements (on a six-point Likert agreement scale), sum them, and then aggregate onto a one-to-ten point scale.

INDEX VALIDATION IN 2011

In 2011, TNTP contracted with American Institutes for Research (AIR) to study the link between the Insight Index, student achievement, and planned teacher retention.

AIR fit each school's Insight Index into a series of logit regression models in order to determine whether the Index was a significant predictor of student achievement. The models included the Insight Index for the school, the percentage of African American students, the percentage of Hispanic students, school enrollment, and the percentage of students receiving free or reduced-price lunch. The outcome measure was the percentage of students classified as proficient or higher in math and reading, according to the results of state standardized tests.

The results showed that TNTP's Insight Index is a valid predictor of student performance. The Insight Index was a significant predictor of student achievement in math in five out of the six sites studied and a significant predictor of student achievement in reading in four of the six sites studied.

To model the relationship between the Insight Index and planned teacher retention, AIR examined results from 318 schools and ran a series of generalized hierarchical linear models. Binomial regression with a logistic link function was used to model the binary outcome of teachers planning to stay or leave their school. Because these two possible outcomes were identical across all the sites, AIR ran a single analysis to assess the predictive validity of the Insight Index on teachers' planned retention. Site-level effects were used to account for variations in retention rates among the sites.

AIR found that the Insight Index is a strong negative predictor that teachers will indicate they plan to leave the school. For each unit increase in the Insight Index, teachers are only 81 percent as likely to leave as before (or 19 percent *less* likely to leave). The Insight Index is a valid predictor of planned teacher retention at the $p < 0.05$ level.

INTERNAL INSIGHT VALIDATION SINCE AIR

The Index and School Growth

In spring 2013, TNTP analyzed the relationship between the Insight Index and school growth scores at 173 schools in Tennessee. We ran an ANOVA between school growth scores and school Index scores and found that schools having stronger Index scores have higher growth scores.

Our results showed that growth scores at top-performing schools were 22 percent higher in literacy and 29 percent higher in numeracy than the growth scores at bottom-performing schools.[1] Given a growth score from 1 to 5, top-performing schools had an average growth score of 2.9 in literacy and 4.5 in numeracy while bottom-performing schools had an average growth score of 2.0 in literacy and 3.3 in numeracy. The differences between school groups were statistically significant at $p < 0.01$ for both literacy and numeracy.

Trends were similar in Washington, D.C. as well. We examined 39 charter schools with both reading and math value-added scores that also participated in Insight in 2013 and found that schools with higher Index scores had higher value-added scores in reading and math. Index scores and reading growth had a correlation of 0.356 and Index scores and math scores were correlated at 0.443. The relationships were both statistically significant at $p < 0.05$.

The Index and Student Proficiency

We also analyzed the relationship between the Insight Index and the percent of students proficient in literacy and numeracy at 95 schools in Tennessee in 2013. We ran an ANOVA between student proficiency percentages and the Insight Index and found that schools having stronger Index scores have a higher share of students proficient in literacy and numeracy.

Our results showed that top-performing schools on the Insight Index had an additional 14 percent of students proficient in literacy and an additional 16 percent of students proficient in numeracy, as compared to bottom-performing schools. At top-performing schools, an average of 36 percent of students were proficient in literacy and 41 percent were proficient in numeracy, while bottom-performing schools had average proficiency rates of 22 in literacy and 25 in numeracy. The differences between school groups were statistically significant at $p < 0.05$ for both literacy and numeracy.

Our findings were similar when we analyzed the relationship between Insight Index and student proficiency rates at 45 schools in Washington, D.C. in 2013. Schools with stronger Index scores have a higher percentage of students achieving proficiency in reading and math. Top-performing schools on the Index had an additional 17 percent of students proficient in reading and an additional 24 percent of students proficient in math, as compared to bottom-performing schools. The differences between school groups were statistically significant at $p < 0.01$ for both reading and math.

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[1] "Top-performing" and "bottom-performing" refer to measures of school culture throughout the technical appendix. For the purposes of this paper, we have defined "top-performing" schools as those in the top 25 percent on the Insight Index and "bottom-performing" schools as those in the bottom 25 percent on the Insight Index.

The Index and Teacher Retention

We reviewed the relationship between the Insight Index and planned teacher retention in spring 2013 and found AIR's 2011 findings still valid. We ran an ANOVA between percent of teachers planning to leave their school within the next two years and school Index scores on the 574 schools in our national dataset. Schools having stronger Index scores were likely to lose fewer of their teachers in the next two years.

At top-performing schools, 21 percent of teachers planned to leave their school within the next two years while bottom-performing schools were likely to lose teachers at twice that rate--43 percent of teachers at bottom-performing schools planned to leave their school in the next two years. The findings were similar when including only high-performing teachers in the analysis.[2] Eighteen percent of high-performing teachers at top-performing schools planned to leave their school within the next two years, while 44 percent of high-performing teachers at bottom-performing schools planned to leave in the same timeframe. The differences between school groups were statistically significant at $p < 0.01$ for both analyses.

We continue to validate the Insight Index both internally and externally on a regular basis.

DATA SOURCE & METHODOLOGY

National charter results reported throughout this paper reflect surveys completed by 4,234 teachers at 201 schools spanning more than a dozen cities nationwide. Results from Boston charter schools reflect the responses of 482 teachers at 20 charter schools in Boston and three charter schools located in neighboring communities that are part of networks also operating in Boston.

All responses included in this study were collected in the spring of 2014, from April 21st through June 20th. Only schools meeting a minimum response rate of 40 percent are included in the study.[3] The minimum response rate was validated by AIR in 2011, where they found no meaningful change in school-level reliability of the Insight Index and question responses when including schools with a minimum response rate of 40 percent.

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[2] High-performing teachers were identified by schools and school leaders.

[3] Two exceptions have been made to this minimum response rate at schools where there is no meaningful difference in findings given a response rate with slightly fewer than 40 percent. In these cases, we have included schools with response rates from 35 to 39 percent in our analyses as well.

SURVEY METHODOLOGY

Teachers received a unique link to the online survey. We worked with participating schools to generate teacher rosters and gather performance ratings for individual teachers. Performance ratings were supplied by 176 charter schools (88 percent of the 201 schools included in the study).

Each teacher received a survey including questions about instructional culture spanning the standard domains. Some surveys incorporated additional questions from the optional workload and hiring domains, or other optional domains or custom questions as well. In the national charter sector, 155 schools (77 percent) included the hiring domain and 160 schools (79 percent) included the workload domain in their survey. Table I includes the full set of domains that were covered in the survey administered to the Boston charter schools and referenced in this study.

Table I | Insight Survey Domains, School Year 2013-2014

Domain	Core Domain Descriptions
Instructional Culture Index	The Index summarizes the strength of the management behaviors and the instructional culture in schools. The Index allows comparisons across schools, within a district and nationally, to help leaders to learn from their peers.
Learning Environment	Students and teachers need a safe and predictable environment to focus on the hard work of learning. In this domain, teachers assess the consistency of expectations and consequences for student conduct, as well as leadership support in maintaining a productive learning environment.
Observation & Feedback	Classroom observation should be a powerful source of feedback for teachers, as well as a valuable source of information for teacher evaluation. In this domain, teachers report how frequently they are observed and how consistently they get helpful feedback to improve their instruction.
Student Growth Measures	Formal and informal assessments of what students are learning should guide teachers to adjust what they teach to ensure all kids succeed. In this domain, teachers report on whether they share student assessments, and if their school works with them to make sense of student assessment data to improve their instruction.
Professional Development	High quality professional development should help all teachers improve their practice. In this domain, teachers report on their experiences with professional development and how well professional development helps them learn new skills they can use in the classroom.

Instructional Planning	Teachers should have time to collaborate on instructional plans. Leaders should reinforce high expectations for what students can learn and ensure a cohesive instructional program for students. In this domain, teachers assess the support from school leadership and opportunities to collaborate with other teachers to improve instructional planning.
Evaluation	Evaluation systems should set clear expectations for teachers and generate useful feedback on their performance. In this domain, teachers report how clearly performance expectations have been communicated, how much they agree with those expectations, and how accurately evaluations represent teacher performance in this school.
Peer Culture	Teachers want to work with colleagues who share their priorities and who can provide examples of exemplary teaching. Effective teachers are much more likely to keep teaching in schools with a strong peer culture. In this domain, teachers report their perceptions of colleagues within the school.
Career Progression	One of the keys to sustaining a successful school is retaining effective teachers, developing future school leaders, and extending the influence of strong teachers in middle leadership positions. This domain captures teachers' perceptions of their future career options within the school and organization.
Retention	Teachers want to remain at schools where they feel valued and are encouraged to remain teaching. In this domain, teachers report the strategies their school leaders have used in order to encourage their development and retain them at their school.
Workload*	Teachers often cite a heavy workload as the main reason they plan to leave their school. In this domain, teachers report the amount of time they spend on classroom work and share their perspective on their school's ability to help teachers maintain a sustainable workload.
Hiring*	To build and sustain teams of effective teachers, schools should hire early, communicate clear expectations, and select the best teachers from their available candidate pool. This domain quantifies a school's hiring timeline and assesses rigor of the interview as well as the depth of the orientation process for teachers new to the school.

***Optional Domain**—this domain is not included in every survey as of the spring 2014 administration

Participating charter schools include schools in Boston, Cleveland, Washington, D.C., the state of Delaware, Trenton, Indianapolis, Philadelphia, Memphis, Milwaukee, Nashville, New York, Newark, and the Los Angeles area.

Insight analysis in charter sectors including Washington, D.C. and Newark, New Jersey took similar approaches to TNTP's approach in Boston—where all schools are invited to participate in the survey free of charge in partnership with a local philanthropic funder. In those sectors, nearly two-thirds of all charter schools participated in the survey.

Unless otherwise noted, all percentages cited in this study reflect the school average of teacher agreement rates to survey questions.

Table II | Insight Survey Participation, Spring 2014

	Boston Charter Schools	National Charter Sites
Schools surveyed	23	203
Teachers sureveyed at schools meeting the minimum response rate	624	5,194
Survey responses (response rate)	482 (77%)	4,234 (82%)
Schools meeting the minimum response rate	23	201
Schools including the optional hiring domain (hiring domain inclusion rate)	23 (100%)	155 (77%)
Schools including the optional workload domain (workload domain inclusion rate)	23 (100%)	160 (79%)
Survey administration dates	06/02/2014 – 06/18/2014	04/21/2014 – 06/20/2014

BOSTON CHARTER SAMPLE

Though the sample of Boston charter schools included in this study is not random, it represents a majority of charter schools in Boston in both number and student demographics. Seventeen of the 26 charter schools located in Boston that run independently from the Boston Public School district (65 percent) participated in this study. Additionally, two in-district charter schools, two charter schools in Lynn, Massachusetts and one charter school from the nearby city of Chelsea, Massachusetts are also included in the Boston charter school results of this paper. The final participating school is a middle school housed on the same campus as one of the independently run charter high schools in our sample. While the middle and high schools are part of one charter campus, their results are counted separately in our analysis.

The student demographic profile of participating Boston charter schools is representative of both the non-district Boston charter schools, as well as the entire population of Boston charter schools. Differences in student demographics and achievement levels are neither statistically nor substantively significant between the participating Boston charter schools and the non-district charter schools and the entire Boston charter school population.

Table III | Boston Charter School Participation Comparison, Spring 2014

	Number of Schools	Percent of Students Qualifying for Free or Reduced Priced Lunch[4]	Percent of Students Identifying as African-American or Hispanic	Percent of Students Proficient in Math[5]	Percent of Students Proficient in English and Language Arts
Boston Charter Schools Participating in Insight	19	71%	85%	63%	71%
Non-District Charter Schools	26	72%	87%	64%	73%
In-District Charter Schools	6	84%	88%	51%	67%
All Boston Charter Schools	32	75%	87%	61%	72%

[4] Massachusetts Department of Elementary and Secondary Education (2014). http://profiles.doe.mass.edu. Only schools with student demographic data are included in these free and reduced-priced lunch and minority population school averages. Demographic data are from the 2013-14 school year.

[5] Massachusetts Department of Elementary and Secondary Education (2014). http://profiles.doe.mass.edu. Only schools with proficiency data are included in these math proficiency and ELA school averages. Achievement data are from the 2013-14 school year.

BENCHMARKING BOSTON PERFORMANCE ON STUDENT OUTCOMES

The case study of practices in Boston is particularly relevant and useful because Boston charter schools have been shown to outperform the local district schools, which are in and of themselves strong relative to most available comparisons to other large, urban school districts. Table IV shows the national math and reading scores of school districts studied by the Center for Research on Education Outcomes and highlighted in Figure 2 of *Greenhouse Schools in Boston.* These districts were selected based on their relatively similar size and student demographic makeup, as well as the availability of test score data. Of the five urban school districts noted in the table below, students at Boston district schools scored highest on NAEP's 4th and 8th grade math test and 8th grade reading test.

Table IV | Urban District NAEP Results, 2013[6]

City	Grade 4 Math	Grade 8 Math	Grade 4 Reading	Grade 8 Reading
Boston	237	283	214	257
Detroit	204	240	190	239
Los Angeles	228	264	205	250
New York City	236	274	216	256
Washington, D.C.	229	260	206	245

*New Orleans data unavailable on the NAEP website.

[6] National Center for Education Statistics (2014), District Profiles. http://nces.ed.gov/nationsreportcard/districts/.