SRI Education
A DIVISION OF SRI INTERNATIONAL

Evaluation of New Teacher Center's i3 Validation Grant

Methods Appendix to Findings Brief

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Appendix A. Methods

This appendix presents the data sources and methods used in SRI Education's evaluation of the New Teacher Center's (NTC's) Investing in Innovation (i3) Validation grant. The evaluation used a randomized controlled trial (RCT) in two districts—Broward County Public Schools (BCPS) and Chicago Public Schools (CPS)—to study the impact of NTC's new teacher induction model on teacher practice and student achievement.[1]

Data Sources

Exhibit A-1 lists the data sources and their purposes for this study.

Exhibit A-1. Data Sources and Their Purposes

Data Source	Purpose					
	Randomly assign schools	Teacher eligibility	Teacher outcomes analysis	Student outcomes analysis	Sensitivity and follow-up analyses	Implementation and treatment-control contrast
School demographic and achievement data	X		X	X	X	X
Human resources data		X	X	X	X	
Teacher observations			X		X	
Teacher, mentor, school leader, and district leader interviews						X
Teacher and mentor surveys					X	X
Student demographics and achievement data				X	X	

[1] Grant Wood Area Education Agency (GWAEA), a consortium of districts in Iowa, also implemented the NTC model. Because the model was implemented with all new teachers, SRI used a difference-in-differences approach to study impact in GWAEA. Data collection was delayed because of a lack of centralized data and a state testing calendar that allows for fall, winter, and spring test administration. Methods and findings from GWAEA will be published in a subsequent report.

Selection and Random Assignment of Schools and Teacher Eligibility

This study includes two cohorts of schools, the first randomly assigned in 2013 and the second randomly assigned in 2014. All schools serving grades K–8 in CPS and all schools serving grades K–12 in BCPS who hired beginning teachers before October 1, 2013, (Cohort 1) or October 1, 2014, (Cohort 2) were eligible to participate in the study. Starting in the late summer, we collected data from the school districts on hiring in all district schools and identified those schools with eligible first-year teachers.

Teachers were eligible for this study if they were in their first year of teaching and were hired into an instructional position within a study school by October 1, 2013, (Cohort 1) or October 1, 2014, (Cohort 2). Teachers were defined as "first-year" teachers if they had less than 2 continuous months of prior teaching experience, excluding experience as a substitute teacher and experience in foreign countries. While each district stored data on teachers' prior experience, this data varied in its type, breadth, quality, and consistency. On the teacher survey in each year, we asked teachers to provide their self-reported years of experience, but this data also proved to be both incomplete (response rates were low) and inconsistent (teachers provided different answers on the survey than they did to their mentors). Therefore, we relied on NTC staff to verify eligibility with both the treatment and control groups.

In the first year (2013–14) in CPS, we randomly assigned participating schools employing beginning teachers to treatment and control conditions, blocking on geographic area (18 categories) and grades served (K–5 or K–8 school). These blocking variables were selected because school context and student achievement vary substantially by both geography and school level in CPS. Because layoffs and school closings delayed hiring in summer 2013, we randomly assigned schools in waves. As each new group of schools with beginning teachers was identified, we randomly assigned them to the treatment or control condition until we reached the target number of beginning teachers to be served (135 treatment and control teachers). NTC hired nine mentors in CPS in the first year, each with the capacity to serve 15 teachers. However, mentors served both first- and second-year teachers. Therefore, the total number of study treatment teachers (first-year teachers) they were able to serve in CPS in Cohort 1 was 68. The study then included 68 control teachers for a balanced sample. See Exhibit A-2 for a graphic depiction of this process.

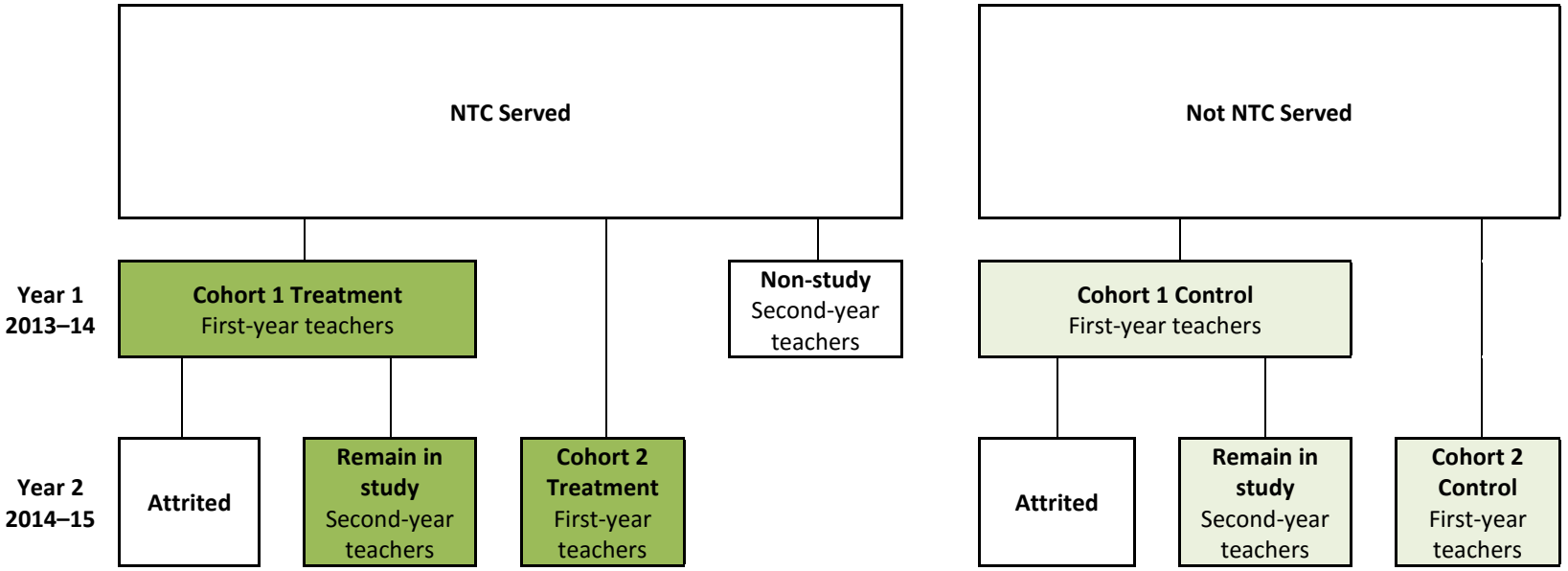
In the second year of the study (2014–15), all Cohort 1 teachers who remained in CPS were included in the study, and treatment teachers continued to be served by the NTC mentors. However, 14 treatment teachers left the district and/or attrited from the study, and all second-year (non-study) teachers served by NTC mentors during the prior year were no longer being served. Therefore, NTC mentors had additional capacity in their rosters, and were able to add more than 68 additional first-year teachers in Cohort 2. All first-year teachers newly hired into the existing treatment and control schools in 2014–15 were added to the study first. Then, to reach the target number of beginning teachers, we randomly assigned additional schools to the treatment and control conditions. The first and second cohorts thus totaled 149 treatment and 139 control teachers, before attrition. The approach of assigning schools as they hired new teachers and setting a cut-off date of October 1 meant that the study sample included only schools that

completed at least a portion of their hiring early in the school year. However, as discussed below, the study schools generally reflected the demographics of the district, so selecting schools with hiring completed early likely did not impact generalizability.

In BCPS, we randomly assigned a sample of participating schools employing new teachers to treatment and control conditions, blocking on Teacher Incentive Fund (TIF) status and grades served (elementary, middle, and high schools). These blocking variables were selected because school context and student achievement vary substantially by both TIF status and school level in BCPS. Within each block, we assigned schools to the NTC program or to the usual district supports for new teachers, until the target number of beginning teachers was reached. NTC hired seven mentors in BCPS in the first year, each with the capacity to serve 15 teachers. Unlike CPS, BCPS mentors served only first-year teachers in that first year of implementation. Therefore, the total number of study treatment teachers (first-year teachers) they were able to serve in BCPS in Cohort 1 was 105. The study was only able to identify 88 teachers in control schools, so the sample in the first cohort was unbalanced at the teacher level, though balanced at the school level.

In the second year (2014–15), all incoming first-year teachers in BCPS treatment schools were added to the treatment group and all incoming first-year teachers in control schools were added to the control group. To reach the target number of beginning teachers for Cohort 2, we also randomly assigned new schools to the treatment and control conditions. The first and second cohorts thus totaled 193 treatment and 148 control teachers. See Exhibit A-2 for a graphic depiction of this process. The number of control teachers was lower than the number of treatment teachers because the schools were uneven in the number of first-year teachers they hired before October 1.

Exhibit A-2. Schematic of Teachers in Schools Randomly Assigned to Treatment and Control, Years 1 and 2



In both districts, NTC served all new teachers in treatment schools unless they were served by other comprehensive induction programs with an intensive mentoring component such as Teach for America. To the extent possible, teachers covered under other induction programs with intensive mentoring components were excluded from both the treatment and control conditions.

At the time of random assignment, the schools included in this study had high average proportions of non-white students (86 percent) and students receiving free or reduced-price lunch (78 percent). They were distributed across the categories of school quality assigned by their districts, with slightly more schools in the highest categories (Exhibit A-3).[2]

[2] At the time of random assignment, BCPS assigned all schools a letter grade from A to F, while CPS used whole numbers between 1 and 3. This baseline "Report Card Rating" was used as a control for school quality in the models.

Exhibit A-3. Descriptive Statistics for All Study Schools[3]

	Overall		Treatment		Control	
	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**
Site						
District A	43%	50	46%	50	40%	49
District B	57%	50	54%	50	60%	49
Cohort						
Cohort 1	45%	50	45%	50	45%	50
Cohort 2	55%	50	55%	50	55%	50
School demographics						
Percent free or reduced-price lunch	78%	22	79%	20	77%	24
Percent non-white	86%	17	88%	17	84%	18
Report Card Rating of F or 3	18%	38	17%	38	18%	39
Report Card Rating of D	6%	24	6%	23	7%	25
Report Card Rating of C or 2	29%	45	30%	46	27%	45
Report Card Rating of B	10%	30	12%	33	7%	26
Report Card Rating of A or 1	38%	49	35%	48	41%	49
Percent English language learners	18%	17	17%	18	18%	17
Percent special education	13%	10	13%	6	13%	13
Blocking Variables						
District A block 1	16%	36	16%	37	15%	36
District A block 2	8%	28	10%	30	7%	26
District A block 3	9%	29	10%	30	9%	29
District A block 4	4%	20	6%	23	3%	16
District A block 5	3%	16	2%	14	3%	18
District A block 6	2%	15	3%	16	2%	14
District B block 1	1%	8	0%	0	1%	12
District B block 2	2%	13	1%	11	2%	14
District B block 3	0%	6	0%	0	1%	8
District B block 4	1%	8	0%	0	1%	12
District B block 5	20%	40	17%	37	23%	42
District B block 6	14%	35	15%	36	13%	34
District B block 7	5%	21	6%	23	3%	18
District B block 8	12%	32	13%	34	11%	31
District B block 9	4%	19	3%	18	4%	20
n Schools	*306*		*156*		*150*	

[3] All district-level outcomes analyses are labeled District A and District B to preserve confidentiality.

Teacher Outcomes Analysis

The teacher outcomes analysis combined teachers across cohorts in their first and second years of teaching as detailed in Exhibit A-4. The purpose of this approach was to maximize the size of the sample.

Exhibit A-4. Cohort by School Year and Years of Experience

	Years of Teaching Experience	
New Teacher Cohort	**1**	**2**
Cohort 1	2013–14	2014–15
Cohort 2	2014–15	2015–16

In BCPS, the study sample included high school teachers. In CPS, NTC served only teachers in K–8 so the study sample was limited to those grades. The study sample was primarily white (56 percent) and female (78 percent) and most study teachers held a Bachelor's degree as their highest degree (72 percent; Exhibit A-5).

Exhibit A-5. Descriptive Statistics for All Study Teachers

	Overall		Treatment		Control	
	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**
Site						
District A	54%	50	56%	50	52%	50
District B	46%	50	44%	50	48%	50
Cohort						
Cohort 1	50%	50	46%	50	54%	50
Cohort 2	50%	50	54%	50	46%	50
Teacher race/ethnicity						
White	56%	50	53%	50	59%	49
Black/African American	25%	44	27%	44	24%	43
Asian/Pacific Islander	3%	18	3%	18	3%	17
Hispanic	13%	34	14%	35	11%	32
Native American	1%	10	2%	13	0%	6
Other[4]	2%	13	1%	12	2%	13
Female	**78%**	**42**	**77%**	**42**	**78%**	**41**
Teacher highest degree						
Associate's	2%	15	3%	17	2%	13
Bachelor's	72%	45	73%	45	71%	45
Master's	24%	42	22%	41	26%	44
Only partial certification	**27%**	**44**	**28%**	**45**	**25%**	**43**
n teachers	*629*		*342*		*287*	

[4] The "other" race category was only available in one of the districts.

Teacher Retention in the District

Sample. The teacher retention analysis included all eligible study teachers with no restrictions.

Data and Measures. Teacher retention in the district was measured using human resources (HR) data provided by the districts. Teachers were counted as "retained" if they were still employed by the district 2 years after the start of the study. Teachers in Cohort 1 were retained if they were still employed by the district as of October 1, 2015. Teachers in Cohort 2 were retained if they were still employed by the district as of October 1, 2016. Districts were not able to provide consistent data on the job description of the study participants. Therefore, we cannot say definitively whether study teachers were retained in instructional positions, or in other types of positions within the district. Therefore, this analysis measured the impact of the NTC model on retention of teachers in any position within the district. Districts and program staff were able to provide information on reductions-in-force (RIFs) or layoffs due to budget cuts. This analysis was designed to exclude these teachers, as the induction program cannot impact attrition due to layoffs and beginning teachers tend to be disproportionately affected by layoffs. However, no budget-based RIFs or layoffs were identified in the data in either year.

Attrition. Because the districts were able to provide HR data for all study teachers, they were all included in the retention analysis, with zero attrition.

Statistical Analysis. To analyze the impact of the NTC model on teacher practice, we estimated the following two-level logistic regression model, with teachers nested within schools:

Level 1 (Teachers): $y^*_{jk} = \beta_{0k} + \beta_1 Treatment_{jk} + \beta_{2k} Z_{jk} + \beta_{3k} Coh_{jk} + \beta_{4k} Z_{jk} Coh_{jk} + r_{jk}$

Level 2 (Schools): $\beta_{0k} = \gamma_{00} + \gamma_{01} W_k + \gamma_{02} Dist_k + \gamma_{03} W_k Dist_k + e_k$

$$\beta_{1k} = \gamma_{10}$$
$$\beta_{2k} = \gamma_{20} + \gamma_{21} Dist_k$$
$$\beta_{3k} = \gamma_{30} + \gamma_{31} W_k + \gamma_{32} Dist_k + \gamma_{33} W_k Dist_k$$
$$\beta_{4k} = \gamma_{40} + \gamma_{41} Dist_k$$

Mixed:

$$y_{jk} = \gamma_{00} + \gamma_{10} Treatment_{jk} + \gamma_{01} W_k + \gamma_{20} Z_{jk} + \gamma_{02} Dist_k + \gamma_{30} Coh_{jk} + \gamma_{03} W_k Dist_k + \gamma_{21} Z_{jk} Dist_k + \gamma_{31} W_k Coh_{jk} + \gamma_{40} Z_{jk} Coh_{jk} + \gamma_{32} Dist_k Coh_{jk} + \gamma_{33} W_k Coh_{jk} Dist_k + \gamma_{41} Z_{jk} Coh_{jk} Dist_k + r_{jk} + e_k$$

In this model, y^*_{jk} represents the underlying latent probability that a teacher will be retained. The γ_{10}coefficient estimates the impact of NTC on teacher retention among new teachers. Z_{jk} represents a vector of teacher-level controls, W_k represents a vector of school-level controls, Coh_{jk} is a cohort indicator, and $Dist_k$ is a district indicator. All variables were centered to the analysis sample. The model also included interactions with district, cohort, and a district-by-cohort three-way interaction for each teacher and school control variable. We controlled for school- and teacher-level covariates to account for pre-existing differences between treatment and control that may be associated with teacher retention, and to increase the precision of our

estimates. Although treatment was randomly assigned at the school level, there may have been remaining differences between the groups due to chance.

We included cohort and district effects as well as interactions between the covariates and these effects for three reasons. First, we expected that the two districts would have different contexts and therefore the NTC intervention may have a different impact in each district. For that reason, we planned to run separate models for each district as well as a combined model for both districts. Second, we expected that the implementation of the program may improve over time, such that the impact in the two cohorts would be different. For that reason, we planned to run separate models for each cohort. Third, in both districts the context changed substantially over the 3 years of the study, which we expected may affect the outcomes of the two cohorts differently. This strengthened our rationale for including a cohort effect.

Baseline equivalence. We are unable to provide data on the baseline equivalence of the teacher retention samples on the same metric as the outcome because all study teachers were newly hired at the beginning of the study (i.e., they could not be retained in the district before they were hired). What Works Clearinghouse (WWC) guidance on other potential measures to use for baseline equivalence on this outcome was not yet available at the time this study was designed, and we do not have any baseline data that WWC categorizes as acceptable for this outcome. However, as there was zero attrition in the analytic sample and schools were randomly assigned to treatment and control, baseline equivalence is not required.

Results. The overall proportion of teachers retained in their districts was similar among the treatment and control teachers (78.9 versus 78.4 percent). However, treatment teachers were retained at slightly higher rates in Cohort 1 (83.8 percent versus 77.0 percent) and slightly lower rates in Cohort 2 (75.1 percent versus 80.0 percent) overall (Exhibit A-6).

Exhibit A-6. Descriptive Differences in Teacher Retention Between Treatment and Control

		Retention into Y3			N
		Control	Treatment	Difference	Teachers
Cohorts combined	Overall	78.4%	78.9%	0.5%	620
	District A	85.3%	81.9%	-3.4%	331
	District B	71.4%	75.2%	3.7%	289
Cohort 1	Overall	77.0%	83.8%	6.8%	296
	District A	86.1%	88.8%	2.7%	159
	District B	66.7%	77.9%	11.3%	137
Cohort 2	Overall	80.0%	75.1%	-4.9%	324
	District A	84.4%	76.9%	-7.5%	172
	District B	76.1%	72.8%	-3.2%	152

None of the differences in retention rates between treatment and control teachers was statistically significant when estimated using a multi-level logistic regression and accounting for differences between teachers and schools. However, the direction of the coefficients remains the same as in the descriptive analysis (Exhibit A-7). Full model tables are included in Appendix C.

Exhibit A-7. The Impact of the NTC Model on Teacher Retention in the District

		Estimate	Standard Error	P-value	N teachers	N Schools
Cohorts combined	Overall	0.05	0.24	0.84	620	228
	District A	-0.27	0.35	0.44	331	87
	District B	0.33	0.39	0.40	289	141
Cohort 1	Overall	0.84	0.48	0.08	296	132
	District A	0.64	0.69	0.35	159	60
	District B	1.03	0.69	0.14	137	72
Cohort 2	Overall	-0.42	0.31	0.17	324	165
	District A	-0.82	0.46	0.08	172	61
	District B	-0.16	0.51	0.76	152	104

Classroom Observations of Teacher Practice

Sample. The analysis of classroom observations included treatment and control teachers who were randomly selected and were observed in fall 2013 (time 1) and spring 2015 (time 2) for Cohort 1 or fall 2014 (time 1) and spring 2016 (time 2) for Cohort 2. Teachers were eligible for the sample if they taught core subjects (mathematics, reading/English language arts, social studies, science, or self-contained elementary classrooms), and all observations were conducted during instruction in the core subjects. In BCPS, the observation sample included high school teachers. In CPS, NTC served only teachers in K–8 so the observation sample was limited to those grades.

An approximately equal number of teachers was observed at baseline across districts and cohorts (Exhibit A-8). As in the larger sample, observed teachers were predominantly white (50 percent) and female (81 percent) and held a Bachelor's (69 percent) as their highest degree. On average, these teachers taught in schools with high proportions of non-white students (85 percent) and students receiving FRPL (77 percent). Their schools were distributed across the categories of school quality assigned by their districts, with slightly more schools in the highest categories. Unlike the larger study sample, substantially more observed teachers in treatment were only partially certified (35 percent) compared to control (20 percent; Exhibit A-8).

Exhibit A-8. Descriptive Statistics for Sample of Teachers Observed at Baseline

	Overall			Treatment			Control		
	Mean	SD	N obs	Mean	SD	N obs	Mean	SD	N obs
Site									
District A	50%	50	233	50%	0.50	121	49%	50	112
District B	50%	50	233	50%	0.50	121	51%	50	112
Cohort									
Cohort 1	50%	50	233	48%	0.50	121	52%	50	112
Cohort 2	50%	50	233	52%	0.50	121	48%	50	112
Teacher race/ethnicity									
White	49%	50	233	44%	50	121	55%	50	112
Black/African American	26%	44	233	26%	44	121	26%	44	112
Asian/Pacific Islander	3%	17	233	4%	20	121	2%	13	112
Hispanic	16%	37	233	19%	39	121	13%	34	112
Other	5%	22	233	7%	25	121	4%	19	112
Female	49%	50	232	80%	40	121	83%	38	111
Teacher highest degree									
Associate's	2%	14	211	2%	13	109	2%	14	102
Bachelor's	69%	46	213	69%	46	111	70%	46	102
Masters	27%	45	217	27%	44	112	28%	45	105
Only partial certification	28%	45	228	35%	48	119	20%	40	109
School demographics									
Percent free or reduced-price lunch	77%	21	233	77%	19	121	78%	23	112
Percent non-white	85%	16	233	86%	17	121	85%	16	112
Report Card Rating of F or 3	13%	34	233	12%	33	121	13%	34	112
Report Card Rating of D	5%	22	233	2%	16	121	8%	27	112
Report Card Rating of C or 2	34%	48	233	37%	49	121	31%	47	112
Report Card Rating of B	14%	34	233	17%	37	121	11%	31	112
Report Card Rating of A or 1	34%	47	233	31%	47	121	37%	48	112
Percent English language learners	17%	16	233	17%	17	121	18%	16	112
Percent special education	12%	4	233	13%	4	121	12%	5	112
Blocking Variables									
District A block 1	15%	36	233	12%	33	121	19%	39	112
District A block 2	12%	32	233	12%	32	121	12%	32	112
District A block 3	14%	35	233	16%	37	121	13%	33	112
District A block 4	5%	21	233	6%	23	121	4%	19	112
District A block 5	3%	18	233	4%	20	121	3%	16	112

Exhibit A-8. Descriptive Statistics for Sample of Teachers Observed at Baseline (concluded)

	Overall			Treatment			Control		
	Mean	SD	N obs	Mean	SD	N obs	Mean	SD	N obs
District A block 4	5%	21	233	6%	23	121	4%	19	112
District A block 5	3%	18	233	4%	20	121	3%	16	112
District A block 6	1%	9	117	2%	13	63	0%	0	54
District B block 1	1%	9	233	0%	0	121	2%	13	112
District B block 2	3%	16	233	1%	9	121	4%	21	112
District B block 3	1%	9	117	0%	0	63	2%	14	54
District B block 4	2%	13	117	0%	0	63	4%	19	54
District B block 5	18%	39	233	19%	39	121	17%	38	112
District B block 6	12%	32	233	12%	32	121	12%	32	112
District B block 7	6%	23	233	7%	25	121	4%	21	112
District B block 8	7%	26	233	8%	28	121	6%	24	112
District B block 9	3%	17	233	3%	18	121	3%	16	112

Data and Measures. Teacher outcomes were measured through structured classroom observations using the Framework for Teaching (Danielson Group, 2013).[5] Trained observers scored the observed teachers on each of the 12 elements under four components of Classroom Environment and the 15 elements under four components of Instruction on the Framework for Teaching. Each element has a scale from 1 to 4 where 1 is "unsatisfactory," 2 is "basic," 3 is "proficient," and 4 is "distinguished." Observers were blind to teachers' treatment or control condition when they conducted the observations.

For descriptive purposes, we combined the element-level scores into component-level scores using a simple average approach. The average scores at baseline on each component of the Framework for Teaching for this group of beginning teachers ranged from 1.9 (just below "basic") to 2.6 (halfway between "basic" and "proficient"; Exhibit A- 9).

[5] Danielson, C. (2013). *The framework for teaching evaluation instrument: 2013 edition*. Princeton, NJ: The Danielson Group.

Exhibit A- 9. Average Observation Scores at Baseline

	Mean	SD	N obs
Environment of Respect and Rapport	2.6	0.62	233
Establishing a Culture for Learning	2.4	0.54	233
Managing Classroom Procedures	2.3	0.59	232
Managing Student Behavior	2.4	0.59	233
Communicating with Students	2.5	0.42	233
Questioning and Discussion Techniques	1.9	0.59	233
Engaging Students in Learning	2.1	0.53	233
Using Assessment in Instruction	2.0	0.48	233

Instead of using these simple averages in analysis, we created component-level variables by combining elements via factor analysis. Factors combined element-level scores on each component of the Framework for Teaching into one component-level variable. The factor variable reflects the structure of the correlations between the elements. It is similar to a weighted average of the elements, where the weights include the strength of the relationship between the elements as well as teachers' scores on those elements.

Each factor variable is continuous, has a mean of 0 and a standard deviation of 1, and the majority of teachers score in the range from -2 to 2. A score of zero on each component therefore is equivalent to being at the average score for all teachers observed in fall 2013 (for Cohort 1) or fall 2014 (for Cohort 2). A change of 1.0 in these variables is a change of 1 standard deviation, which is roughly equivalent to 0.5 or 0.6 point on the original 1 to 4 scale of the elements, where 1 is "unsatisfactory," 2 is "basic," 3 is "proficient," and 4 is "distinguished." A difference of 1.0 on the factor scores, therefore, is equivalent to about half the distance between "basic" and "proficient" on the original scale. Exhibit A-10 shows the results of the factor analysis and the variables that were created. The eigenvalues for all factors were over 1.5 and the reliabilities (Cronbach's alpha) for each of these scales were acceptable, though not high.

Exhibit A-10. Properties of Factor Observation Variables

	Elements	Eigenvalue	Alpha
Creating an environment of respect and rapport	1. Teacher interactions with students 2. Student interactions with one another	1.5	0.64
Establishing a culture for learning	1. Importance of content 2. Expectations for learning and achievement	1.5	0.66
Managing classroom procedures	1. Management of instructional groups 2. Management of transitions 3. Management of materials and supplies 4. Performance of classroom routines	2.5	0.81
Managing student behavior	1. Expectations 2. Monitoring of student behavior 3. Response to student misbehavior	2.3	0.84
Communicating with students	1. Expectations for learning 2. Directions for activities 3. Explanations of content 4. Use of oral and written language	1.9	0.60
Questioning and discussion techniques	1. Quality of questions/prompts 2. Discussion techniques 3. Student participation	2	0.73
Engaging students in learning	1. Activities and assignments 2. Grouping of students 3. Instructional materials and resources 4. Structure and pacing	2.6	0.82
Using assessment in instruction	1. Assessment criteria 2. Monitoring of student learning 3. Feedback to students 4. Student self-assessment and monitoring of progress	2.1	0.68

Attrition. Under the National Evaluation of i3 (NEi3), an RCT is considered eligible for the Meets i3 Criteria without Reservations designation if each analysis meets the WWC "liberal attrition standards." These standards track attrition first at the cluster (school) level, followed by the individual (teacher) level.

Schools attrited from the sample when all teachers who were selected for observation within the school attrited, i.e., were not observed at both time periods. Exhibit A-11 displays the number of treatment and control schools with teachers selected for observation in each cohort,[6] the number of schools with teachers observed at both time periods, and the school-level attrition by condition in each district and overall. WWC standards for attrition take into account both overall attrition and the difference in attrition between treatment and control groups. In Cohort 1, overall school-level attrition was 36 percent, with differential attrition of 0 percentage points. In Cohort 2, overall attrition was 21 percent, with differential attrition of 6 percentage points. When combined, the attrition for both cohorts was 23 percent, with differential attrition of 2 percentage points. These were all within the range of acceptable attrition. For district-specific analyses, the school-level attrition and differential attrition met WWC attrition standards in Cohort 1 and with the two cohorts combined, but exceeded the acceptable thresholds in Cohort 2.

Individual (teacher) level attrition was calculated only on teachers that remained in non-attrited schools. Teachers attrited from this analysis if they left the profession or the district, or refused to be observed, or we were unable to schedule them for an observation either at baseline or at follow-up. Exhibit A-12 shows the teacher-level attrition, which was within acceptable levels for all analyses.

[6] This number includes all schools with teachers selected, including those who declined to participate, and the teachers who replaced them. In some cases, the teachers selected as replacements also declined to participate. Therefore, the total number of schools selected may have been larger in one district or condition than in the others, with the aim of obtaining a final sample that was balanced across treatment and control in each district.

Exhibit A-11. Cluster-Level Attrition for Observation Analysis

		Cohort 1				Cohort 2				Combined			
		Treat-ment	Control	Differential	Overall	Treat-ment	Control	Differential	Overall	Treat-ment	Control	Differential	Overall
District A	Selected for observation	21	20			24	17			32	30		
	Stayed and were observed at Time 2	**12**	**12**			**18**	**15**			**24**	**23**		
	Percent attrited	43%	40%	3%	41%	25%	12%	13%	20%	25%	23%	2%	24%
	Attrition standard	*Met standard*				*Did not meet standard*				*Met standard*			
District B	Selected for observation[7]	24	22			21	25			41	38		
	Stayed and were observed at Time 2	**17**	**15**			**19**	**17**			**31**	**30**		
	Percent attrited	29%	32%	3%	30%	10%	32%	22%	22%	24%	21%	3%	23%
	Attrition standard	*Met standard*				*Did not meet standard*				*Met standard*			
Overall	Selected for observation	45	42			45	42			71	70		
	Stayed and were observed at Time 2	**29**	**27**			**37**	**32**			**55**	**53**		
	Percent attrited	36%	36%	0%	36%	18%	24%	6%	21%	23%	24%	2%	23%
	Attrition standard	*Met Standard*				*Met Standard*				*Met Standard*			

Note: Cohorts do not sum to the overall total because some schools include both Cohort 1 and Cohort 2 teachers.

[7] This number includes schools that attrited both before the baseline observation and between observations.

Exhibit A-12. Teacher-Level Attrition for Observation Analysis

		Cohort 1				Cohort 2				Combined			
		Treat-ment	Control	Differential	Overall	Treat-ment	Control	Differential	Overall	Treat-ment	Control	Differential	Overall
District A	Selected for observation	21	30			28	25			49	55		
	Stayed and were observed at Time 2	**14**	**19**			**23**	**21**			**37**	**40**		
	Percent attrited	33%	37%	3%	35%	18%	16%	2%	17%	24%	27%	3%	26%
	Attrition standard	*Met standard*				*Met standard*				*Met Standard*			
District B	Selected for observation	21	26			29	22			50	48		
	Stayed and were observed at Time 2	**18**	**20**			**25**	**19**			**43**	**39**		
	Percent attrited	14%	23%	9%	19%	14%	14%	0%	14%	14%	19%	5%	16%
	Attrition standard	*Met standard*				*Met standard*				*Met Standard*			
Overall	Selected for observation	42	56			57	47			99	103		
	Stayed and were observed at Time 2	**32**	**39**			**48**	**40**			**80**	**79**		
	Percent attrited	24%	30%	7%	28%	16%	15%	1%	15%	19%	23%	4%	21%
	Attrition standard	*Met standard*				*Met standard*				*Met Standard*			

Attrition had two main consequences. First, the number of schools remaining in the analysis sample was low, as was the number of teachers in each of these schools, even when both cohorts and districts were combined. Lower sample size limited our ability to detect the effects of the NTC model on teacher practice, particularly if those effects were small or there was great variability in teacher practice among teachers.

Second, the schools and teachers who remained in the sample may have differed in both measurable and unmeasurable ways from those who attrited. This implication was particularly problematic with differential attrition, as treatment teachers and schools who left may have been substantially different from control teachers and schools who left. The second issue was partly addressed through measuring the baseline equivalence of the teachers who remained in the sample, as discussed below.

Baseline equivalence. Because differential attrition between the treatment and control groups was evident at the district-within-cohort level, we examined baseline equivalence in the observation scores of the teachers included in the analysis. Baseline equivalence was measured using the same model as was used to measure outcomes (discussed below), applied only to the baseline measures. Where attrition exceeds acceptable standards, an outcome analysis can still Meet Criteria with Reservations if the baseline difference between treatment and control is less than 0.05 standard deviation, or if the difference is between 0.05 and 0.25 standard deviation and a baseline measure is included in the model.

In the district-specific analyses, attrition exceeded acceptable thresholds for each district in Cohort 2 (Exhibit A-11). As shown in Exhibit A-13, the baseline difference between treatment and control was greater than 0.25 standard deviation in a large number of the components at the district level (marked with a †), particularly when further broken down by cohort. This, combined with the attrition in these samples, resulted in a number of estimates that did not meet WWC standards. The cells with these estimates are shaded in grey and the impact estimates in these cells are not reported in Exhibit A-15.

Exhibit A-13. Baseline Observation Difference Between Treatment and Control, by Cohort and by District

	District A Public Schools			District B Public Schools		
	Cohorts Combined	Cohorts Combined	Cohort 1	Cohort 2	Cohort 1	Cohort 2
Creating an environment of respect and rapport	0.21	-0.03	-0.50†	0.40†	-0.06	0.21
Establishing a culture for learning	-0.13	0.13	-0.1	0.37†	-0.32†	0.08
Managing classroom procedures	0.2	0.29†	-0.01	0.52†	-0.13	0.20
Managing student behavior	0.32†	0.28†	-0.14	0.59†	0.15	0.32†
Communicating with students	-0.04	-0.13	-0.07	-0.15	0.01	-0.04
Using questioning and discussion techniques	0.02	0.33†	0.16	0.46†	0.07	0.02
Engaging students in learning	0.1	0.38†	0.03	0.76†	-0.07	0.1
Using assessment in instruction	0.24	0.33†	0.49†	0.26†	0.12	0.24
Number of teachers	*77*	*82*	*38*	*44*	*33*	*44*

† Difference between treatment and control was greater than 0.25 standard deviation.
Cells where differential attrition exceeded WWC standards and baseline difference was greater than 0.25 standard deviation are shaded grey.

The samples that combined the two RCT sites met acceptable thresholds for attrition; however, we also tested baseline equivalence within these samples. With the two RCT sites and both cohorts combined, the difference in baseline observation scores ranged from 0.07 standard deviation on creating an environment of respect and rapport to 0.26 standard deviation on communicating with students and using assessment in instruction (Exhibit A-14). Where the absolute value of each of these differences was less than 0.25 standard deviation, baseline observation scores were included in the model, and thus the analysis achieved baseline equivalence. For the two components that exceeded acceptable standards for baseline difference (managing student behavior and using assessment in instruction), we applied a propensity score weight to the models, predicting treatment from each of these components at baseline, as a correction for this lack of equivalence. These components are marked with a cross (†).

In the cohort-specific analyses, the baseline difference between treatment and control in Cohort 1 was greater than 0.25 standard deviation in creating an environment of respect and rapport. Therefore, we applied the propensity score weight approach to this model. In Cohort 2 the baseline difference was greater than 0.25 standard deviation in six of the eight components. We also applied propensity weights to these models.

Exhibit A-14. Baseline Difference Between Treatment and Control Analysis Samples in Teacher Practice Scores for RCT Sites Combined

	Cohorts Combined	Cohort 1	Cohort 2
Creating an environment of respect and rapport	0.07	-0.32†	0.35†
Establishing a culture for learning	0.08	-0.22	0.38†
Managing classroom procedures	0.247	0.03	0.39†
Managing student behavior	0.26†	-0.04	0.48†
Communicating with students	-0.09	-0.04	-0.14
Using questioning and discussion techniques	0.17	0.11	0.19
Engaging students in learning	0.21	-0.04	0.42†
Using assessment in instruction	0.26†	0.22	0.28†
Number of teachers	*159*	*70*	*89*

† Propensity score weight applied to account for inequivalent baseline

Statistical Analysis. To analyze the impact of the NTC model on teacher practice, we estimated the following two-level model, with teachers nested within schools:

Level 1 (Teachers): $y_{jk} = \beta_{0k} + \beta_1 Treatment_{jk} + \beta_{2k} Z_{jk} + \beta_{3k} Coh_{jk} + \beta_{4k} Z_{jk} Coh_{jk} + r_{jk}$

Level 2 (Schools): $\beta_{0k} = \gamma_{00} + \gamma_{01} W_k + \gamma_{02} Dist_k + \gamma_{03} W_k Dist_k + e_k$

$$\beta_{1k} = \gamma_{10}$$
$$\beta_{2k} = \gamma_{20} + \gamma_{21} Dist_k$$
$$\beta_{3k} = \gamma_{30} + \gamma_{31} W_k + \gamma_{32} Dist_k + \gamma_{33} W_k Dist_k$$
$$\beta_{4k} = \gamma_{40} + \gamma_{41} Dist_k$$

Mixed:

$$y_{jk} = \gamma_{00} + \gamma_{10} Treatment_{jk} + \gamma_{01} W_k + \gamma_{20} Z_{jk} + \gamma_{02} Dist_k + \gamma_{30} Coh_{jk} + \gamma_{03} W_k Dist_k + \gamma_{21} Z_{jk} Dist_k + \gamma_{31} W_k Coh_{jk} + \gamma_{40} Z_{jk} Coh_{jk} + \gamma_{32} Dist_k Coh_{jk} + \gamma_{33} W_k Coh_{jk} Dist_k + \gamma_{41} Z_{jk} Coh_{jk} Dist_k + r_{jk} + e_k$$

In this model, y_{jk} represents the teacher's score on one of eight components of the Framework for Teaching, discussed above, standardized using the full baseline sample mean and standard deviation. Scores were standardized to create a truly linear scale and to estimate an effect size in standard deviation units. The coefficient γ_{10} estimates the impact of the NTC model on teacher practice for each component. Z_{jk} represents a vector of teacher-level controls (including baseline observation score on the same component), W_k represents a vector of school-level controls (including the blocking variables used in randomization), Coh_{jk} is a cohort indicator, and $Dist_k$ is a district indicator. All variables were centered to the analysis sample. The model also included interactions with district, cohort, and a district-by-cohort three-way interaction for each teacher and school control variable. We included school- and teacher-level covariates, cohort and district effects, and interactions between the covariates and these effects for the same reasons we included them in the retention analysis.

This analysis was an intent-to-treat analysis, in which all teachers who were randomly selected to be observed were included in their original assigned condition, regardless of cross-over, noncompliance, or level of treatment received. Teachers who changed schools between the baseline and follow-up observations were followed into their new schools and observed where possible. We used their original school location for the school control variables in the models.

Results. There were no statistically significant differences in teacher practice scores between treatment and control teachers overall. However, there were a few differences by district (Exhibit A-15). In District A, treatment teachers had significantly higher scores in establishing a culture for learning and managing student behavior in the first cohort, but in the second cohort the analysis did not meet WWC standards for attrition and baseline equivalence, and when the cohorts were combined, these differences were not apparent. In District B, treatment teachers had significantly *lower* scores in establishing a culture for learning in Cohort 1, but the Cohort 2 analysis did not meet standards for attrition and baseline equivalence, and the combined analysis did not show a statistically significant difference. Treatment teachers in District B also scored significantly higher on managing classroom procedures when the cohorts were combined. These inconsistent and largely non-significant results can be attributed in part to the small sample size, particularly when looking by cohort and district. Full model tables are included in Appendix C.

Exhibit A-15. Impact of the NTC Model on Teacher Practice by District and Cohort

	District A			District B			Districts Combined		
	Cohort 1	Cohort 2	Combined	Cohort 1	Cohort 2	Combined	Cohort 1	Cohort 2	Combined
Creating an environment of respect and rapport	0.29	♦	-0.05	0.1†	♦	0.15	-0.05†	-0.1†	0.04
Establishing a culture for learning	**0.73**†**	♦	-0.11	**-0.68***	♦	-0.34	-0.11	-0.14†	-0.24
Managing classroom procedures	-0.04	♦	-0.36	0.43	♦	**0.56*†**	-0.36	0.07†	0.13
Managing student behavior	**1.08*****	♦	0.26†	-0.32	♦	0.28†	0.26	0.18†	0.28†
Communicating with students	0.40	0.11	0.19	-0.48	-0.10	-0.29	0.19	0.08	0.01
Using questioning and discussion techniques	0.13	0.01	0.12	-0.19	♦	0.14†	0.12	0.28	0.21
Engaging students in learning	0.15	0.34	0.32	-0.35	♦	-0.04†	0.32	0.43†	0.15
Using assessment in instruction	0.01	♦	0.21	-0.3†	♦	-0.21†	0.21	0.18†	0.06†

***$p < 0.001$
**$p < 0.01$
*$p < 0.05$
†Propensity score weight applied to account for inequivalent baseline
♦ Outcome is not reported because the measure did not meet WWC standards for attrition and baseline significance

Student Outcomes Analysis

Sample

The student achievement analysis sample included all beginning teachers in treatment and control schools who taught reading and/or mathematics in grades 4–8. Special education teachers who taught reading and/or mathematics and who could be linked to students in district data sets were included in the analysis, along with regular education teachers.[8] As in the teacher outcomes analysis, the student outcomes combine teachers and students across cohorts.

As shown in Exhibit A-16, the students in this analysis were predominantly African American (37 to 45 percent) and Hispanic (35 to 49 percent). They were low-income, with close to 90 percent qualifying for free or reduced-price lunch. The teachers of these students were similar to the study sample, predominantly white and female.

Exhibit A-16. Descriptive Statistics for Students in the Achievement Analysis

	Mathematics		Reading	
	Control	Treatment	Control	Treatment
Student Demographics				
Grade 4	16%	24%	15%	14%
Grade 5	19%	28%	19%	21%
Grade 6	24%	10%	19%	33%
Grade 7	26%	14%	29%	18%
Grade 8	16%	24%	18%	13%
Race - African American	45%	37%	39%	48%
Race – Hispanic	40%	49%	46%	35%
Race – White	9%	6%	9%	8%
Race – Asian	5%	5%	4%	7%
Race - Native American	0%	0%	0%	0%
Free/reduced-price meals	87%	90%	86%	89%
Special education/IEP	19%	19%	18%	18%
English learner	12%	16%	11%	12%
Female	49%	48%	49%	48%
Teacher Demographics				
Race - African American	23%	18%	34%	30%
Race – Hispanic	10%	32%	14%	11%
Race – White	62%	38%	49%	48%
Race – Asian	1%	2%	1%	8%
Race - Native American	0%	4%	0%	2%
Race – Other	1%	6%	1%	1%

[8] In District A, 2 percent of the teachers in the reading sample and 0 percent of teachers in the mathematics sample were listed as belonging to a special education department. In District B, 16 percent of teachers in the reading sample were listed as special education teachers, as were 17 percent of teachers in the mathematics sample.

Exhibit A-16. Descriptive Statistics for Students in the Achievement Analysis (concluded)

	Mathematics		Reading	
	Control	Treatment	Control	Treatment
Highest degree – Associates	0%	0%	0%	0%
Highest degree – Bachelors	60%	77%	55%	78%
Highest degree – Masters	40%	23%	45%	21%
Not fully certified	25%	9%	12%	24%
Female	77%	72%	88%	82%
School Demographics				
Percent free/reduced-price meals	84%	84%	81%	84%
Report Card Rating[9]	2.2	2.2	2.2	2.6
Percent non-white	90%	92%	88%	91%
Percent English learners	17%	29%	20%	22%
Percent IEP	12%	12%	11%	12%
Blocking variables[10]				
District A block 1	7%	7%	6%	12%
District A block 3	0%	0%	4%	0%
District A block 2	20%	10%	18%	20%
District A block 4	3%	9%	2%	4%
District A block 5	16%	5%	10%	10%
District A block 6	2%	1%	1%	0%
District B block 9	3%	0%	1%	0%
District B block 1	27%	28%	23%	30%
District B block 5	5%	2%	6%	2%
District B block 7	4%	24%	11%	8%
District B block 8	2%	0%	1%	0%
District B block 2	7%	13%	13%	13%
District B block 6	0%	0%	0%	0%
District B block 10	2%	0%	1%	0%
District B block 3	4%	0%	4%	0%
District B block 4	0%	0%	0%	0%
n Students	*2,719*	*2,348*	*3,216*	*3,434*

[9] 0 = F in BCPS and 3 in CPS; 1 = D in BCPS; 2 = C in BCPS & 2 in CPS; 3 = B in BCPS; 4 = A in BCPS and 1 in CPS.

[10] Blocking variable names are being kept consistent across model results, which resulted in some of the blocking variables appearing out of order.

Data and Measures

Student achievement was measured using the state standardized test in each district. However, CPS began transitioning from the Illinois State Achievement Test (ISAT) to the Partnership for Assessment of Readiness for College and Careers (PARCC) assessments during the 2014–15 school year, the second year of the intervention. The transition was marked by controversy, and not all schools required students to take the PARCC assessment. In the meantime, students were required to take the Northwest Evaluation Association (NWEA) Measures of Academic Progress (MAP) assessment. Therefore, the study used the ISAT as the outcome and baseline measure in the first year of the intervention (2013–14) and the MAP as the outcome and baseline measure in subsequent years.

Exhibit A-17 shows the mean and standard deviation of the mathematics test scores in each year, combining cohorts. The number of students for each scale score mean varied because the scores were used for different analyses—the 2012–13 scores were used as baseline for Cohort 1, so the mean included only one cohort of students. The 2013–14 scores were used as outcomes for Cohort 1 Year 1 and baseline for Cohort 2 Year 1, so the mean included two cohorts of students. Similarly, the 2014–15 scores were used as outcomes for Cohort 1 Year 2 and Cohort 2 Year 1, as well as baseline for Cohort 2 Year 2, so the mean included two cohorts of students. Finally, the 2015–16 scores were used as outcomes for Cohort 2 Year 2, so the mean included only one cohort of students. Likewise, the number of students in Exhibit A-17 does not align with the number in Exhibit A-19 because they combine cohorts differently. Exhibit A-19 combines Cohort 1 in Year 2 with Cohort 2 in Year 2, with Year 2 of each cohort being the outcome year for the 2-year NTC mentoring program.

Exhibit A-17 shows that the overall standardized scores had a mean near zero with a standard deviation near one. The slight deviation from these exact numbers was due to students who were used in the standardization calculation and then dropped from the analysis because of missing covariates. Exhibit A-17 also indicates that the scale scores in both district increased slightly most years. The achievement analysis accounted for these historical changes by standardizing to the district and year, and including district and cohort controls in the models.

Exhibit A-17. Mathematics Test Descriptives by Study Year

	Treatment			Control		
	Mean	**SD**	***n***	**Mean**	**SD**	***n***
Standardized Scores						
Outcome	0.01	0.97	5082	-0.02	0.91	5062
Pretest	0.01	0.97	5082	0.01	1.00	5062
Scale scores						
FCAT 2012–13	208.1	24.9	357	214.4	22.3	752
FCAT 2013–14	210.4	24.4	1264	220.0	22.6	1812
FCAT 2014–15	310.4	26.1	1524	317.3	23.0	1250
FCAT 2015–16	309.6	22.6	551	309.1	20.2	191
ISAT 2012–13[11]	219.9	32.2	597	212.6	28.5	604
ISAT 2013–14	232.5	28.9	597	225.8	27.0	604
MAP 2012–13	206.6	17.2	592	202.1	15.3	597
MAP 2013–14	214.0	17.0	2548	211.5	17.9	2335
MAP 2014–15	220.8	17.6	2601	219.4	18.1	2455
MAP 2015–16	223.9	15.8	646	229.3	18.3	709

Exhibit A-18 shows the mean and standard deviation of the reading/ELA test scores in each study year, combining cohorts. As in mathematics, the overall reading/ELA standardized scores had a mean near zero with a standard deviation near one. Exhibit A-18 also indicates that the reading/ELA scale scores in both districts increased slightly each year. The achievement analysis accounted for these historical changes by standardizing to the district and year, and including district and cohort controls in the models.

[11] The models used ISAT scores for Cohort 1 Year 1 (2013–14) and MAP scores for all other years. The ISAT was not administered in 2014–15 or 2015–16, so it was not included in the Year 2 descriptives.

Exhibit A-18. Reading/ELA Test Descriptives by Study Year

	Treatment			Control		
	Mean	SD	*n*	Mean	SD	*n*
Standardized Scores						
Outcome	0.02	0.98	7380	-0.03	0.99	5418
Pretest	0.01	1.00	7380	-0.04	0.97	5418
Scale scores						
FCAT 2012–13	212.0	23.3	851	210.6	19.6	993
FCAT 2013–14	212.1	24.8	2421	212.9	20.1	1619
FCAT 2014–15	306.4	24.8	2697	308.3	21.5	909
FCAT 2015–16	306.7	22	1127	309.5	20.5	283
ISAT 2012–13[12]	217.3	32.6	817	220.5	31.5	1032
ISAT 2013–14	226.9	29.5	817	226.4	29.2	1032
MAP 2012–13	203.0	19.5	814	204.1	18.1	1010
MAP 2013–14	207.1	19.9	2875	206.9	17.5	2894
MAP 2014–15	210.3	16.4	3015	209.9	17.5	2484
MAP 2015–16	214.5	15.7	951	216.2	18.2	596

Attrition

In the student achievement analysis, schools attrited from the sample when all teachers who teach tested subjects within the school attrited, i.e., they did not have students included in the achievement analysis. Exhibit A-19 and Exhibit A-20 display the number of treatment and control schools, teachers and students by analysis year and subject, and the school-, teacher-, and student-level attrition by condition in each district and overall. WWC standards for attrition take into account both overall attrition and the difference in attrition between treatment and control groups.

For analysis of the impact of NTC on mathematics achievement after 2 years of induction for teachers (2014–15 for Cohort 1 and 2015–16 for Cohort 2), overall school-level attrition was 11 percent, with differential attrition of 6 percentage points. Within the non-attrited schools, overall teacher-level attrition was 2 percent, with differential attrition of 2 percentage points. Finally, within non-attrited teachers, overall student-level attrition was 11 percent with differential attrition of 2 percentage points. This analysis meets the WWC attrition standards at each level. The same is true within both districts.

For analysis of the impact of NTC on reading/ELA achievement after 2 years of mentoring, overall school-level attrition was 10 percent, with differential attrition of 4 percentage points. Within the non-attrited schools, overall teacher-level attrition was 3 percent, with differential attrition of 2 percentage points. Finally, within non-attrited teachers, overall student-level attrition was 14 percent with differential attrition of 2 percentage points. This analysis meets the WWC attrition standards at each level. The same is true in both districts.

[12] The models used ISAT scores for Cohort 1 Year 1 (2013–14) and MAP scores for all other years. The ISAT was not administered in 2014–15 or 2015–16, so it was not included in the Year 2 descriptives.

Exhibit A-19. Attrition for Analysis of the Impact of NTC on Student Achievement in Mathematics after Two Years of Induction for Teachers

		MATHEMATICS											
		Schools				Teachers				Students			
		Treat	Control	Differential	Overall	Treat	Control	Differential	Overall	Treat	Control	Differential	Overall
District A	Eligible	29	12			33	16			1223	863		
	Included in the mathematics model	**22**	**9**			**32**	**16**			**1067**	**726**		
	Percent attrited	24%	25%	1%	24%	3%	0%	3%	2%	13%	16%	3%	14%
	Attrition standard	*Met Standard*				*Met Standard*				*Met Standard*			
District B	Eligible	30	26			39	44			1725	1784		
	Included in the mathematics model	**29**	**26**			**39**	**42**			**1584**	**1595**		
	Percent attrited	3%	0%	3%	2%	0%	5%	5%	2%	8%	11%	2%	9%
	Attrition standard	*Met Standard*				*Met Standard*				*Met Standard*			
Overall	Eligible	59	38			72	60			2948	2647		
	Included in the mathematics model	**51**	**35**			**71**	**58**			**2651**	**2321**		
	Percent attrited	14%	8%	6%	11%	1%	3%	2%	2%	10%	12%	2%	11%
	Attrition standard	*Met Standard*				*Met Standard*				*Met Standard*			

Exhibit A-20. Attrition for Analysis of the Impact of NTC on Student Achievement in Reading/ELA after Two Years of Induction for Teachers

		READING / ELA											
		Schools				Teachers				Students			
		Treat	Control	Differential	Overall	Treat	Control	Differential	Overall	Treat	Control	Differential	Overall
District A	Eligible	29	15			37	20			2418	789		
	Included in the mathematics model	**23**	**12**			**35**	**20**			**1922**	**636**		
	Percent attrited	21%	20%	1%	20%	5%	0%	5%	4%	21%	19%	1%	20%
	Attrition standard	*Met Standard*				*Met Standard*				*Met Standard*			
District B	Eligible	31	35			45	51			2209	1733		
	Included in the mathematics model	**30**	**34**			**44**	**50**			**2023**	**1566**		
	Percent attrited	3%	3%	0%	3%	2%	2%	0%	2%	8%	10%	1%	9%
	Attrition standard	*Met Standard*				*Met Standard*				*Met Standard*			
Overall	Eligible	60	50			82	71			4627	2522		
	Included in the mathematics model	**53**	**46**			**79**	**70**			**3945**	**2202**		
	Percent attrited	12%	8%	4%	10%	4%	1%	2%	3%	15%	13%	2%	14%
	Attrition standard	*Met Standard*				*Met Standard*				*Met Standard*			

Baseline Equivalence

Although differential attrition between treatment and control groups was not evident overall, we examined baseline equivalence in the achievement test scores of the students included in each analysis (Exhibit A-21). Baseline equivalence was measured using the same model as was used to measure outcomes (discussed below), applied only to the baseline measures. Where attrition exceeds acceptable standards, an outcome analysis can still Meet Criteria with Reservations if the baseline difference between treatment and control is less than 0.05 standard deviation, or if the difference is between 0.05 and 0.25 standard deviation and a baseline measure is included in the model.

Exhibit A-21. Baseline Difference Between Treatment and Control Analysis Samples

Years of Induction	District	Mathematics	Reading/ELA
One year	Overall	-0.01	0.01
	District A	0.07	0.13
	District B	-0.07	-0.05
Two years	Overall	0.01	0.1
	District A	-0.11	0.17
	District B	0.07	0.09

Statistical Analysis

To analyze the impact of the NTC model on student achievement, we estimated the following three-level model, with students nested within teachers nested within schools:

Level 1 (Students): $y_{ijk} = \pi_{0jk} + \pi_{1jk}X_{ijk} + e_{ijk}$

Level 2 (Teachers): $\pi_{0jk} = \beta_{00k} + \beta_{01k}Z_{jk} + \beta_{02k}Coh_{jk} + \beta_{03k}Z_{jk}Coh_{jk} + r_{0jk}$

$$\pi_{1jk} = \beta_{10k} + \beta_{11k}Coh_{jk}$$

Level 3 (Schools): $\beta_{00k} = \gamma_{000} + \gamma_{001}W_k + \gamma_{002}Dist_k + \gamma_{003}W_kDist_k + r_k$

$$\beta_{01k} = \gamma_{010} + \gamma_{011}Dist_k$$
$$\beta_{02k} = \gamma_{020} + \gamma_{021}W_k + \gamma_{022}Dist_k + \gamma_{023}W_kDist_k$$
$$\beta_{03k} = \gamma_{030} + \gamma_{031}Dist_k$$
$$\beta_{10k} = \gamma_{100} + \gamma_{101}Dist_k$$
$$\beta_{11k} = \gamma_{110} + \gamma_{111}Dist_k$$

Mixed:

$$\begin{aligned} y_{ijk} = {} & \gamma_{000} + \gamma_{001}W_k + \gamma_{010}Z_{jk} + \gamma_{100}X_{ijk} + \gamma_{002}Dist_k + \gamma_{020}Coh_{jk} + \gamma_{003}W_kDist_k \\ & + \gamma_{021}W_kCoh_{jk} + \gamma_{011}Z_{jk}Dist_k + \gamma_{030}Z_{jk}Coh_{jk} + \gamma_{101}X_{ijk}Dist_k \\ & + \gamma_{110}X_{ijk}Coh_{jk} + \gamma_{022}Coh_{jk}Dist_k + \gamma_{023}\mathrm{W_kCoh_{jk}Dist_k} + \gamma_{031}\mathrm{Z_{jk}Coh_{jk}Dist_k} \\ & + \gamma_{111}\mathrm{X_{ijk}Coh_{jk}Dist_k} + r_{0jk} + u_{00k} + e_{ijk} \end{aligned}$$

In this model, y_{ijk} represents the student's score on the reading/ELA or mathematics state assessment, standardized using the mean and standard deviation of all students with study teachers provided by the districts. X_{ijk} is a vector of student-level control variables (including prior achievement on the same assessment), Z_{jk} is a vector of teacher control variables, W_k is a vector of school control variables (including the blocking variables used in randomization), Coh_{jk} is a cohort indicator, and $Dist_k$ is a district indicator. All variables were centered to the analysis sample. The model included interactions with district, cohort, and a district-by-cohort three-way interaction for each student, teacher, and school control variable. These control variables and interactions were included for the same theoretical reasons as the teacher analyses. Additionally, as we examined the relationships between each of the covariates and student achievement, we found that the relationships varied by both district and cohort. A model combining districts and cohorts, without interaction terms, would constrain the relationship between covariates and achievement to be the same across districts and cohorts. This constraint may reduce precision and bias the estimates. This examination empirically supported our theoretical reasons for including the interactions.

As with the teacher outcomes analyses, this analysis was an intent-to-treat analysis at the teacher level, in which teachers and their associated students were included in their original assigned condition, regardless of cross-over, noncompliance, or level of treatment received. Both RCT districts were able to provide student data linked to study teachers for all study teachers who started the school year working in the district. In other words, if a teacher left the district during the school year, his or her students were still linked and we obtained their achievement test scores. As discussed in the attrition section above, this reduced attrition from the analysis and maintained the intent-to-treat design within each year.

Results

The NTC model had a significant impact on student achievement in both reading/ELA and mathematics after 2 years of mentoring. This impact was also evident in mathematics in District B, in mathematics with both districts combined in Cohort 1, and in mathematics in District B in Cohort 1. No other district- and cohort-specific analyses found statistically significant impacts (Exhibit A-22).

Exhibit A-22. Impact of the NTC Model on Student Achievement after Two Years of Induction for Teachers, Overall and by Cohort and District

Cohort	District	Subject	Adjusted Mean Test Scores		Difference	Sample sizes		
			Treatment	Control	(Effect Size)	Students	Teachers	Schools
Both Cohorts Combined	Both Districts combined	ELA	0.05	-0.04	**0.09***	6,147	149	99
		Math	0.06	-0.09	**0.15****	4,972	129	86
	District A	ELA	0.02	-0.03	0.05	2,558	55	35
		Math	0.05	0.06	-0.01	1,793	48	31
	District B	ELA	0.06	-0.04	0.10	3,589	94	64
		Math	0.10	-0.09	**0.19****	3,179	81	55
Cohort 1	Both Districts combined	ELA	0.03	-0.08	0.11	3,190	86	59
		Math	0.04	-0.12	**0.16***	2,806	76	52
	District A	ELA	0.01	-0.07	0.08	1,148	32	23
		Math	-0.06	0.06	-0.12	982	27	19
	District B	ELA	0.03	-0.10	0.13	2,042	54	36
		Math	0.11	-0.12	**0.23***	1,824	49	33
Cohort 2	Both Districts combined	ELA	-0.05	-0.05	<0.001	2,957	63	54
		Math	-0.05	-0.12	0.07	2,166	53	47
	District A	ELA	-0.10	-0.08	-0.02	1,410	23	18
		Math	0.09	-0.11	0.20	811	21	18
	District B	ELA	0.07	0.04	0.03	1,547	40	36
		Math	0.01	-0.04	0.05	1,355	32	29

Sensitivity to Teacher Joiners

New WWC standards address the issue of participants joining the study sample after randomization. These "joiners" may bias the study findings if they are substantially different from the participants who were present at the time of randomization, particularly if they chose to join the school because of the presence of the NTC intervention or study. This study did not have access to data on when students joined the study schools or classrooms, so we were not able to exclude student joiners. However, we could identify when teachers joined the study schools.

Under WWC, joiners are divided into "late" and "early" joiners. Teachers who were hired or began their employment at a study school shortly after the randomization can be categorized as early joiners. We may reasonably assume early joiners did not choose to work at the school as a result of the NTC intervention or study, which was put into place only days or weeks before. Teachers who were hired or began their employment at the school substantially after randomization are categorized as late joiners. In this study, because all teachers who were hired after October 1, 2013, were excluded from Cohort 1, and all teachers who were hired after October 1, 2014, were excluded from Cohort 2, late joiners include only Cohort 2 teachers who joined existing study schools in the 2014–15 school year. These teachers may have known about

the induction program in place in the school and chosen to apply and take their position as a result.

To test the sensitivity of the student achievement results to the inclusion of joiners, we fit models identical to those estimated for the main treatment effect reported above, but excluding Cohort 2 teachers who joined in in 2014–15 the study schools that were randomized in 2013–14 under Cohort 1.

We found that excluding late joiner teachers slightly increased the estimates of the impact of the NTC model after 1 year of induction support in both reading and mathematics (Exhibit A-23). The impact of the NTC model on ELA achievement remained positive and statistically significant when late joiner teachers were excluded, with a slight increase in the estimate (from 0.09 to 0.10 standard deviation). Likewise, the impact on mathematics achievement remained positive and statistically significant when late joiner teachers were excluded, with a slight increase in the estimate (from 0.15 to 0.16 standard deviation).

Exhibit A-23. Impact of the NTC Model on Achievement Scores after Two Years of Induction Support, Excluding Late Joiner Teachers

		Impact	N schools	N teachers	N students
ELA	Original estimate	0.09*	99	149	6,147
	Excluding late joiner teachers	0.10*	89	119	4,571
Mathematics	Original estimate	0.15*	86	129	4,972
	Excluding late joiner teachers	0.16*	78	105	3,981

* $p < 0.05$

Implementation and Treatment-Control Contrast

The implementation study examined the extent to which sites carried out the key components of the NTC induction model as designed. Data on implementation fidelity allowed program leads and NTC staff to identify specific areas for improvement, such as barriers to mentors being able to meet with their assigned beginning teachers regularly or supports that mentors and teachers might need to make use of formative assessment tools. The implementation study also documented whether the sites implemented each of the key components of the program to the level of fidelity that would predict an impact on teacher and student outcomes. In addition to measuring implementation fidelity, measuring differences between treatment and control teachers' induction experience helps explain the impact of the NTC induction model, compared with the status quo control condition.

Implementation Fidelity

We measured indicators for each of the four key components of the NTC induction logic model (see Appendix F for a description of each indicator).

- **NTC supports:** Eight indicators of the supports NTC provided in launching the program in each site. One indicator (capacity-building by site leads) was measured only in Years 2 and 3.
- **Mentor selection and assignment:** Three indicators addressing mentor hiring and allocation to new teachers.
- **Mentor development and accountability:** Seven indicators addressing site-level supports and training for mentors.
- **Provision of high-quality mentoring:** Five indicators reflecting the joint activities mentors and beginning teachers engaged in and teachers' perceptions of the quality of their mentoring experience.

Data Sources. Each component required multiple data sources to measure the implementation indicators (Exhibit A-24).

Exhibit A-24. Data Sources for Implementation Components

Component	Data Sources
NTC supports	Attendance log at half-day principal training; logs of one-on-one meetings between site leads and principals; copies of program standards, formative assessment tools and mentor training materials; and Learning Zone data
Mentor selection and assignment	Mentor application materials; mentor survey; and rosters of teacher assignments to mentors
Mentor development and accountability	Attendance log at mentor academies and mentor forums; logs of mentor-to-mentor shadowing, meetings between site leads and mentors, peer coaching, and goal setting
Provision of high-quality mentoring	Learning Zone data; teacher survey

Results. Exhibit A-25 displays the implementation fidelity results at the sample level (i.e., across all participating sites) for each year of the intervention. Appendix F provides additional detail on the calculation of the implementation fidelity scores.

Exhibit A-25. Implementation with Fidelity for Each Key Component of the Intervention, Sample Level (Three Sites)

Key Components (from Logic Model)	Definitions		Findings					
			Year 1 (2013–14)		Year 2 (2014–15)		Year 3 (2015–16)	
	Measurement Fidelity Matrix)	Definition of (see high fidelity at program level	Number of sites meeting fidelity threshold for component	Fidelity at the sample level (High/ Medium/ Low)	Number of sites meeting fidelity threshold for component	Fidelity at the sample level (High/ Medium/ Low)	Number of sites meeting fidelity threshold for component	Fidelity at the sample level (High/ Medium/ Low)
New Teacher Center Supports	Site-level score (based on 8 indicators)	At least 2 sites score high and none score low	Number of sites: High: **3** Medium: **0** Low: **0**	**High**	Number of sites: High: **3** Medium: **0** Low: **0**	**High**	Number of sites: High: **2** Medium: **1** Low: **0**	**High**
Mentor Selection and Assignment	Site-level score (based on 3 indicators)	At least 2 sites score high and none score low	Number of sites: High: **3** Medium: **0** Low: **0**	**High**	Number of sites: High: **3** Medium: **0** Low: **0**	**High**	Number of sites: High: **3** Medium: **0** Low: **0**	**High**
Mentor Development and Accountability	Site-level score (based on 7 indicators)	At least 2 sites score high and none score low	Number of sites: High: **0** Medium: **3** Low: **0**	**Medium**	Number of sites: High: **2** Medium: **1** Low: **0**	**High**	Number of sites: High: **2** Medium: **1** Low: **0**	**High**
Provision of High Quality Mentoring	Site-level score (based on 5 indicators)	At least 2 sites score high and none score low	Number of sites: High: **1** Medium: **2** Low: **0**	**Medium**	Number of sites: High: **3** Medium: **0** Low: **0**	**High**	Number of sites: High: **3** Medium: **0** Low: **0**	**High**

Teacher Surveys

To measure the contrast between the induction experiences of treatment and control teachers, NTC administered surveys to all teachers and mentors served by their program as well as control teachers in the spring of each year of implementation.

Sample. The survey was administered to all eligible study teachers with no restrictions. However, response rates were substantially better among treatment than control teachers (Exhibit A-26).

Exhibit A-26. Survey Response Rates by District and Treatment Status in Each Year

	2013–14		2014–15		2015–16	
	Treatment	Control	Treatment	Control	Treatment	Control
District A	91%	68%	85%	29%	90%	51%
District B	99%	69%	91%	65%	96%	66%
Overall	94%	68%	93%	55%	90%	64%

Note: The response rates include a small number of partially completed surveys.

Data and Measures. We created 14 survey scales from items in the teacher survey, capturing school environment, mentoring and other induction supports, and teacher self-evaluation. Using 2013–14 survey data from all respondents, we carried out a factor analysis to examine the properties of the 14 scale variables. This analysis was used to ensure that combining survey items results in conceptually relevant scales that are also reliable and useful for analysis. All the scales are highly reliable, with most achieving alphas of over 0.8 (Exhibit A-27). After the factor analysis, we created scale variables using a weighted average approach. This approach keeps the composite variables in the same scale as the original items, which makes them easier to interpret.

Exhibit A-27. Properties of Teacher Survey Scale Variables

	Eigenvalue	Alpha	Number of items	*n*
School Environment				
Student Conduct	3.87	0.88	7	454
Instructional Leadership	5.37	0.93	9	454
Teacher Collaboration around Instruction	2.74	0.81	5	454
Supportive Teaching Environment	2.50	0.82	4	454
Availability of Materials	2.07	0.77	3	454
Mentoring and Induction				
Frequency of Mentoring Activities	4.39	0.89	9	374
Frequency of Other Induction Supports	1.93	0.58	4	455
Value of Other Induction Supports	2.23	0.77	4	180
Focus on Instruction	7.53	0.95	14	358
Value of Mentoring Activities	5.80	0.90	9	125
Mentor Support for New Teacher Participation in Other Professional Development[a]	2.75	0.85	4	189
Self-Evaluation				
Teacher Self-Efficacy	4.27	0.88	9	455
Teacher-Reported Growth	8.76	0.96	15	167
Need for Instructional Support	4.35	0.88	9	455

Source: NTC New Teacher Survey, spring 2014 and spring 2016.
[a]Factor based on spring 2016 survey. All other factors are based on spring 2014 survey.

Appendix B. Full Teacher Retention Model Results[13]

Exhibit B-1. Impact of the NTC Model on Teacher Retention, Both Cohorts and Districts Combined

	Estimate	Standard Error	*p*-value
Treatment status	0.048	0.243	0.842
Teacher controls			
Teacher highest degree is Bachelor's CENTERED	0.021	0.273	0.94
Teacher is only partially certified CENTERED	3.521	496.3	0.994
Teacher is female CENTERED	0.117	0.298	0.695
Teacher race is white CENTERED	-0.453	0.258	0.079
School controls			
School percent ELL CENTERED	-0.024	0.016	0.122
School percent IEP CENTERED	-0.076	0.038	0.044
School percent FRPL CENTERED	0.001	0.016	0.962
School percent non-white CENTERED	0.007	0.019	0.714
School report card rating CENTERED	0.042	0.16	0.794
Blocking variables			
District A block 1	0.359	0.854	0.674
District A block 2	-0.546	0.638	0.392
District A block 4	-0.801	1.014	0.43
District A block 5	0.119	0.926	0.898
District B block 9	-0.509	0.793	0.521
District B block 7	-0.049	0.73	0.946
District B block 8	0.726	0.568	0.202
District B block 2	10.343	1367.0	0.994
District B block 6	-0.118	0.474	0.803
District A block 6	-0.529	0.969	0.585
District interactions			
Centered district indictor	-1.252	264.21	0.996
District interaction: Teacher highest degree is Bachelor's	1.031	0.549	0.06
District interaction: Teacher is only partially certified	-9.209	992.8	0.993
District interaction: Teacher is female	0.438	0.595	0.462
District interaction: Teacher race is white	0.176	0.523	0.736
District interaction: School percent ELL	-0.044	0.031	0.153
District interaction: School percent IEP	-0.056	0.076	0.462
District interaction: School percent FRPL	-0.009	0.032	0.782
District interaction: School percent non-white	-0.01	0.038	0.79
District interaction: School report card rating	-0.344	0.32	0.283
Cohort interactions			
Centered cohort indicator	2.761	264.21	0.992
Cohort interaction: Teacher highest degree is Bachelor's	0.554	0.546	0.31
Cohort interaction: Teacher is only partially certified	9.95	992.8	0.992

[13] Blocking variable names are being kept consistent across model results, which resulted in some of the blocking variables appearing out of order in Appendix B exhibits.

Exhibit B-1. Impact of the NTC Model on Teacher Retention, Both Cohorts and Districts Combined (concluded)

	Estimate	Standard Error	*p*-value
Cohort interaction: Teacher is female	0.945	0.594	0.111
Cohort interaction: Teacher race is white	0.431	0.521	0.408
Cohort interaction: School percent ELL	0.034	0.03	0.263
Cohort interaction: School percent IEP	0.135	0.075	0.072
Cohort interaction: School percent FRPL	0.021	0.031	0.503
Cohort interaction: School percent non-white	-0.022	0.037	0.545
Cohort interaction: School report card rating	0.307	0.313	0.326
Cohort interaction: District A block 1	-3.768	1.677	0.025
Cohort interaction: District A block 2	-0.279	1.254	0.824
Cohort interaction: District A block 4	-0.582	1.971	0.768
Cohort interaction: District A block 5	-1.481	1.785	0.407
Cohort interaction: District B block 9	1.421	1.58	0.368
Cohort interaction: District B block 7	1.083	1.427	0.448
Cohort interaction: District B block 8	-1.292	1.118	0.248
Cohort interaction: District B block 2	-20.494	2739.906	0.994
Cohort interaction: District B block 6	0.511	0.927	0.582
Cohort interaction: District A block 6	-1.241	1.872	0.507
District-by-cohort interactions			
District by cohort interaction	-3.633	528.421	0.995
District by cohort interaction: Teacher highest degree is Bachelor's	-0.477	1.092	0.662
District by cohort interaction: Teacher is only partially certified	-18.579	1985.573	0.993
District by cohort interaction: Teacher is female	0.512	1.189	0.667
District by cohort interaction: Teacher race is white	-0.706	1.025	0.491
District by cohort interaction: School percent ELL	-0.016	0.061	0.789
District by cohort interaction: School percent IEP	0.225	0.151	0.137
District by cohort interaction: School percent FRPL	0.043	0.062	0.495
District by cohort interaction: School percent non-white	0.046	0.073	0.533
District by cohort interaction: School report card rating	1.561	0.627	0.013
Constant	2.658	132.105	0.984
Random effects			
School	0.174		
n			
Schools	*228*		
Teachers	*620*		

Exhibit B-2. Impact of the NTC Model on Teacher Retention, Both Cohorts Combined – District A

	Estimate	Standard Error	p-value
Treatment status	-0.27	0.351	0.442
Teacher controls			
Teacher highest degree is Bachelor's CENTERED	0.558	0.406	0.17
Teacher is only partially certified CENTERED	-1.028	0.368	0.005
Teacher is female CENTERED	0.279	0.401	0.487
Teacher race is white CENTERED	-0.338	0.366	0.355
School controls			
School percent ELL CENTERED	-0.047	0.027	0.087
School percent IEP CENTERED	-0.102	0.069	0.14
School percent FRPL CENTERED	-0.005	0.025	0.841
School percent non-white CENTERED	0.005	0.028	0.867
School report card rating CENTERED	-0.095	0.279	0.733
Blocking variables			
District A block 1	0.573	0.766	0.455
District A block 2	-0.351	0.542	0.518
District A block 4	-0.448	0.887	0.613
District A block 5	0.278	0.784	0.723
Cohort interactions			
Centered cohort indicator	0.639	1.038	0.538
Cohort interaction: Teacher highest degree is Bachelor's	0.339	0.808	0.675
Cohort interaction: Teacher is only partially certified	0.753	0.737	0.307
Cohort interaction: Teacher is female	1.214	0.807	0.133
Cohort interaction: Teacher race is white	0.014	0.73	0.985
Cohort interaction: School percent ELL	0.018	0.055	0.747
Cohort interaction: School percent IEP	0.25	0.138	0.071
Cohort interaction: School percent FRPL	0.045	0.049	0.362
Cohort interaction: School percent non-white	-0.007	0.055	0.899
Cohort interaction: School report card rating	1.129	0.554	0.041
Cohort interaction: District A block 1	-3.491	1.537	0.023
Cohort interaction: District A block 2	-0.159	1.093	0.885
Cohort interaction: District A block 4	-0.2	1.767	0.91
Cohort interaction: District A block 5	-1.345	1.577	0.393
Constant	1.968	0.56	0
Random effects			
School	<0.001		
n			
Schools	*87*		
Teachers	*331*		

Exhibit B-3. Impact of the NTC Model on Teacher Retention, Both Cohorts Combined – District B

	Estimate	Standard Error	p-value
Treatment status	0.329	0.392	0.403
Teacher Controls			
Teacher highest degree is Bachelor's CENTERED	-0.55	0.408	0.178
Teacher is only partially certified CENTERED	6.055	468.5	0.99
Teacher is female CENTERED	-0.114	0.472	0.81
Teacher race is white CENTERED	-0.654	0.423	0.122
School controls			
School percent ELL CENTERED	-0.006	0.015	0.681
School percent IEP CENTERED	-0.064	0.035	0.07
School percent FRPL CENTERED	0.011	0.023	0.625
School percent non-white CENTERED	0.006	0.029	0.845
School report card rating CENTERED	0.227	0.159	0.153
Blocking variables			
District B block 9	-0.67	0.96	0.485
District B block 7	-0.275	0.902	0.761
District B block 8	0.769	0.67	0.251
District B block 2	10.008	766.4	0.99
District B block 6	-0.17	0.577	0.768
Cohort interactions			
Centered cohort indicator	3.578	249.4	0.989
Cohort interaction: Teacher highest degree is Bachelor's	0.744	0.809	0.358
Cohort interaction: Teacher is only partially certified	16.043	937.0	0.986
Cohort interaction: Teacher is female	0.807	0.937	0.389
Cohort interaction: Teacher race is white	1.002	0.812	0.218
Cohort interaction: School percent ELL	0.049	0.029	0.083
Cohort interaction: School percent IEP	0.036	0.064	0.571
Cohort interaction: School percent FRPL	-0.009	0.042	0.826
Cohort interaction: School percent non-white	-0.042	0.051	0.407
Cohort interaction: School report card rating	-0.538	0.299	0.072
Cohort interaction: District B block 9	1.85	1.885	0.326
Cohort interaction: District B block 7	1.014	1.653	0.539
Cohort interaction: District B block 8	-1.526	1.257	0.225
Cohort interaction: District B block 2	-19.76	1532.8	0.99
Cohort interaction: District B block 6	0.456	1.072	0.671
Constant	2.825	124.7	0.982
Random Effects			
School	1.031		
n			
Schools	*141*		
Teachers	*289*		

Exhibit B-4. Impact of the NTC Model on Teacher Retention, Cohort 1 Teachers Only – Both Districts Combined

	Estimate	Standard Error	p-value
Treatment status	0.835	0.477	0.08
Teacher controls			
Teacher highest degree is Bachelor's CENTERED	-0.275	0.484	0.57
Teacher is only partially certified CENTERED	-1.699	0.656	0.01
Teacher is female CENTERED	-0.346	0.527	0.511
Teacher race is white CENTERED	-0.869	0.482	0.071
School controls			
School percent ELL CENTERED	-0.053	0.031	0.086
School percent IEP CENTERED	-0.173	0.085	0.042
School percent FRPL CENTERED	-0.012	0.034	0.73
School percent non-white CENTERED	0.018	0.04	0.663
School report card rating CENTERED	-0.107	0.32	0.738
Blocking variables			
District A block 1	2.561	1.71	0.134
District A block 2	-0.689	1.163	0.554
District A block 4	-0.631	1.786	0.724
District A block 5	0.927	1.776	0.602
District B block 9	-1.485	1.431	0.299
District B block 7	-0.833	1.244	0.503
District B block 8	1.475	1.12	0.188
District B block 2	15.642	641.1	0.981
District B block 6	-0.542	0.857	0.527
District A block 6	0.342	1.873	0.855
Interactions with district			
Centered district indicator	0.542	1.27	0.669
District interaction: Teacher highest degree is Bachelor's	1.189	0.972	0.221
District interaction: Teacher is only partially certified	0.259	1.259	0.837
District interaction: Teacher is female	0.286	1.056	0.787
District interaction: Teacher race is white	0.479	0.898	0.593
District interaction: School percent ELL	-0.053	0.061	0.388
District interaction: School percent IEP	-0.184	0.165	0.263
District interaction: School percent FRPL	-0.014	0.068	0.838
District interaction: School percent non-white	-0.076	0.083	0.362
District interaction: School report card rating	-1.272	0.644	0.048
Constant	1.045	0.678	0.124
Random effects			
School	1.182		
n			
Schools	*132*		
Teachers	*296*		

Exhibit B-5. Impact of the NTC Model on Teacher Retention, Cohort 1 Teachers Only – District A

	Estimate	Standard Error	p-value
Treatment status	0.641	0.686	0.35
Teacher controls			
Teacher highest degree is Bachelor's CENTERED	0.314	0.701	0.654
Teacher is only partially certified CENTERED	-1.523	0.628	0.015
Teacher is female CENTERED	-0.207	0.673	0.758
Teacher race is white CENTERED	-0.542	0.652	0.406
School controls			
School percent ELL CENTERED	-0.073	0.053	0.168
School percent IEP CENTERED	-0.243	0.137	0.077
School percent FRPL CENTERED	-0.022	0.051	0.671
School percent non-white CENTERED	-0.011	0.057	0.847
School report card rating CENTERED	-0.737	0.530	0.164
Blocking variables			
District A block 1	2.275	1.435	0.113
District A block 2	-0.688	0.985	0.484
District A block 4	-0.668	1.512	0.659
District A block 5	0.802	1.447	0.579
Constant	1.42	0.935	0.129
Random effects			
School	0.667		
n			
Schools	*60*		
Teachers	*159*		

Exhibit B-6. Impact of the NTC Model on Teacher Retention, Cohort 1 Teachers Only – District B

	Estimate	Standard Error	p-value
Treatment status	1.029	0.688	0.135
Teacher controls			
Teacher highest degree is Bachelor's CENTERED	-0.871	0.686	0.204
Teacher is only partially certified CENTERED	-2.006	1.222	0.101
Teacher is female CENTERED	-0.496	0.827	0.549
Teacher race is white CENTERED	-1.229	0.725	0.09
School controls			
School percent ELL CENTERED	-0.03	0.026	0.246
School percent IEP CENTERED	-0.091	0.066	0.169
School percent FRPL CENTERED	-0.006	0.043	0.888
School percent non-white CENTERED	0.061	0.059	0.297
School report card rating CENTERED	0.569	0.291	0.051
Blocking variables			
District B block 9	-1.63	1.585	0.304
District B block 7	-0.922	1.383	0.505
District B block 8	1.562	1.228	0.203
District B block 2	16.48	798.3	0.984
District B block 6	-0.584	0.948	0.538
Constant	0.758	0.743	0.308
Random effects			
School	1.79		
n			
Schools	*72*		
Teachers	*137*		

Exhibit B-7. Impact of the NTC Model on Teacher Retention, Cohort 2 Teachers Only – Both Districts Combined

	Estimate	Standard Error	p-value
Treatment status	-0.417	0.307	0.174
Teacher controls			
Teacher highest degree is Bachelor's CENTERED	0.332	0.322	0.303
Teacher is only partially certified CENTERED	8.493	1300.0	0.995
Teacher is female CENTERED	0.595	0.344	0.084
Teacher race is white CENTERED	-0.297	0.323	0.358
School controls			
School percent ELL CENTERED	-0.007	0.017	0.674
School percent IEP CENTERED	-0.002	0.038	0.951
School percent FRPL CENTERED	0.009	0.016	0.57
School percent non-white CENTERED	-0.001	0.019	0.974
School report card rating CENTERED	0.221	0.182	0.224
Blocking variables			
District A block 1	-1.546	0.975	0.113
District A block 2	-0.732	0.808	0.365
District A block 4	-0.959	1.149	0.404
District A block 5	-0.794	1.076	0.461
District B block 9	0.266	1.035	0.798
District B block 7	0.769	1.038	0.459
District B block 8	0.18	0.588	0.76
District B block 2	0.124	1.277	0.923
District B block 6	0.293	0.636	0.645
District A block 6	-0.959	1.113	0.389
District interactions			
District indicator	-2.979	691.9	0.997
District interaction: Teacher highest degree is Bachelor's	0.795	0.642	0.216
District interaction: Teacher is only partially certified	-18.411	2600.0	0.994
District interaction: Teacher is female	0.725	0.688	0.292
District interaction: Teacher race is white	-0.107	0.647	0.869
District interaction: School percent ELL	-0.058	0.034	0.085
District interaction: School percent IEP	0.052	0.075	0.484
District interaction: School percent FRPL	0.017	0.033	0.615
District interaction: School percent non-white	0.013	0.039	0.741
District interaction: School report card rating	0.474	0.363	0.191
Constant	4.244	346.0	0.99
Random effects			
School	<0.001		
n			
Schools	*165*		
Teachers	*324*		

Exhibit B-8. Impact of the NTC Model on Teacher Retention, Cohort 2 Teachers Only – District A

	Estimate	Standard Error	p-value
Treatment status	-0.823	0.464	0.076
Teacher controls			
Teacher highest degree is Bachelor's CENTERED	0.794	0.474	0.094
Teacher is only partially certified CENTERED	-0.639	0.467	0.171
Teacher is female CENTERED	0.963	0.518	0.063
Teacher race is white CENTERED	-0.328	0.437	0.452
School controls			
School percent ELL CENTERED	-0.044	0.031	0.16
School percent IEP CENTERED	0.028	0.083	0.732
School percent FRPL CENTERED	0.018	0.026	0.479
School percent non-white CENTERED	0.007	0.031	0.827
School report card rating CENTERED	0.543	0.340	0.11
Blocking variables			
District A block 1	-1.242	0.913	0.174
District A block 2	-0.487	0.731	0.505
District A block 4	-0.43	1.052	0.682
District A block 5	-0.62	1.023	0.545
Constant	2.693	0.811	0.001
Random effects			
School	<0.001		
n			
Schools	*61*		
Teachers	*172*		

Exhibit B-9. Impact of the NTC Model on Teacher Retention, Cohort 2 Teachers Only – District B

	Estimate	Standard Error	p-value
Treatment status	-0.156	0.51	0.759
Teacher controls			
Teacher highest degree is Bachelor's CENTERED	-0.191	0.527	0.716
Teacher is only partially certified CENTERED	14.239	1162.4	0.99
Teacher is female CENTERED	0.258	0.527	0.624
Teacher race is white CENTERED	-0.231	0.553	0.677
School controls			
School percent ELL CENTERED	0.024	0.018	0.179
School percent IEP CENTERED	-0.041	0.038	0.279
School percent FRPL CENTERED	0.006	0.024	0.804
School percent non-white CENTERED	-0.015	0.029	0.614
School report card rating CENTERED	-0.049	0.195	0.801
Blocking variables			
District B block 9	0.324	1.269	0.799
District B block 7	0.675	1.256	0.591
District B block 8	0.133	0.715	0.852
District B block 2	0.049	1.448	0.973
District B block 6	0.208	0.77	0.787
Constant	4.826	309.3	0.988
Random effects			
School	0.943		
n			
Schools	*104*		
Teachers	*152*		

Appendix C. Full Teacher Observation Model Results[14]

Both Cohorts and Districts Combined

Exhibit C-1. Impact of the NTC Model on Creating an Environment of Respect and Rapport – Both Cohorts and Districts Combined

	Estimate	Standard Error	p-value
Treatment status	0.04	0.16	0.81
Baseline score	0.10	0.09	0.26
Teacher controls			
Teacher is female CENTERED	<0.001	0.22	0.98
Teacher race is black CENTERED	-0.02	0.20	0.90
Teacher has only partial certification CENTERED	<0.001	0.28	0.99
School controls			
School percent FRPL CENTERED	<0.001	0.01	0.70
School report card rating - on one scale CENTERED	<0.001	0.10	0.98
School percent non-white CENTERED	<0.001	0.02	0.90
School percent ELL CENTERED	0.01	0.01	0.26
School percent Special Education CENTERED	-0.01	0.02	0.55
Blocking variables			
District A block 3	0.52	0.35	0.14
District A block 2	-0.11	0.35	0.75
District B block 5	-0.60	0.34	0.08
District B block 7	-1.17	0.47	0.01
District B block 8	-0.29	0.33	0.39
District B block 6	-1.21	0.36	<0.001
Interactions with district			
Centered district indicator	-1.05	0.34	<0.001
District interaction: Baseline score	0.38	0.17	0.03
District interaction: Teacher is female	0.13	0.43	0.76
District interaction: Teacher race is black	0.05	0.41	0.91
District interaction: Teacher has only partial certification	-0.58	0.54	0.29
District interaction: School percent FRPL	-0.03	0.02	0.15
District interaction: School report card rating - on one scale	-0.29	0.21	0.16
District interaction: School percent non-white	0.04	0.04	0.30
District interaction: School percent ELL	0.01	0.02	0.50
District interaction: School percent Special Education	0.05	0.05	0.33
Interactions with cohort			
Centered cohort indicator	-0.69	0.33	0.04
Cohort interaction: Baseline score	-0.24	0.17	0.17
Cohort interaction: Teacher is female	-0.47	0.43	0.28
Cohort interaction: Teacher race is black	-0.44	0.41	0.28
Cohort interaction: Teacher has only partial certification	0.12	0.54	0.83
Cohort interaction: School percent FRPL	-0.03	0.02	0.24
Cohort interaction: School report card rating - on one scale	-0.19	0.21	0.36

[14] Blocking variable names are being kept consistent across model results, which resulted in some of the blocking variables appearing out of order in Appendix C exhibits.

Exhibit C-1. Impact of the NTC Model on Creating an Environment of Respect and Rapport – Both Cohorts and Districts Combined (concluded)

	Estimate	Standard Error	p-value
Cohort interaction: School percent non-white	0.02	0.04	0.54
Cohort interaction: School percent ELL	<0.001	0.02	0.83
Cohort interaction: School percent Special Education	-0.12	0.05	0.02
Cohort interaction: District A block 3	-1.19	0.70	0.09
Cohort interaction: District A block 2	0.12	0.70	0.87
Cohort interaction: District B block 5	1.20	0.68	0.08
Cohort interaction: District B block 7	1.29	0.96	0.18
Cohort interaction: District B block 8	0.87	0.65	0.18
Cohort interaction: District B block 6	0.45	0.70	0.52
District-by cohort interactions			
District by cohort interaction	1.60	0.68	0.02
District by cohort interaction: Baseline score	-0.37	0.35	0.29
District by cohort interaction: Teacher is female	-0.61	0.86	0.48
District by cohort interaction: Teacher race is black	0.40	0.83	0.63
District by cohort interaction: Teacher has only partial certification	-0.45	1.09	0.68
District by cohort interaction: School percent FRPL	0.01	0.05	0.86
District by cohort interaction: School report card rating – on one scale	-0.29	0.41	0.49
District by cohort interaction: School percent non-white	-0.07	0.08	0.40
District by cohort interaction: School percent ELL	0.03	0.03	0.43
District by cohort interaction: School percent Special Education	-0.08	0.10	0.39
Constant	0.61	0.17	<0.001
Random effects			
School	<0.001		
Teacher	0.57		
n			
Schools	*108*		
Teachers	*159*		

Exhibit C-2. Impact of the NTC Model on Establishing a Culture for Learning – Both Cohorts and Districts Combined

	Estimate	Standard Error	p-value
Treatment status	-0.24	0.20	0.22
Baseline score	0.06	0.07	0.44
Teacher controls			
Teacher is female CENTERED	-0.19	0.22	0.40
Teacher race is black CENTERED	0.02	0.20	0.91
Teacher has only partial certification CENTERED	-0.39	0.26	0.14
School controls			
School percent FRPL CENTERED	<0.001	0.01	0.81
School report card rating - on one scale CENTERED	0.07	0.12	0.52
School percent non-white CENTERED	-0.01	0.02	0.72
School percent ELL CENTERED	-0.01	0.01	0.27
School percent Special Education CENTERED	-0.03	0.03	0.26
Blocking variables			
District A block 3	-0.83	0.39	0.03
District A block 2	-0.58	0.39	0.13
District B block 5	-0.85	0.42	0.04
District B block 7	-0.55	0.59	0.36
District B block 8	-0.16	0.43	0.71
District B block 6	-0.99	0.44	0.02
Interactions with district			
Centered district indicator	-0.70	0.40	0.08
District interaction: Baseline score	0.36	0.15	0.01
District interaction: Teacher is female	0.19	0.44	0.67
District interaction: Teacher race is black	0.51	0.41	0.21
District interaction: Teacher has only partial certification	0.50	0.52	0.34
District interaction: School percent FRPL	-0.03	0.03	0.22
District interaction: School report card rating - on one scale	<0.001	0.23	0.99
District interaction: School percent non-white	0.06	0.04	0.14
District interaction: School percent ELL	-0.01	0.02	0.63
District interaction: School percent Special Education	-0.05	0.06	0.41
Interactions with cohort			
Centered cohort indicator	-0.12	0.36	0.74
Cohort interaction: Baseline score	-0.09	0.15	0.57
Cohort interaction: Teacher is female	-0.07	0.44	0.87
Cohort interaction: Teacher race is black	-0.30	0.41	0.46
Cohort interaction: Teacher has only partial certification	0.90	0.55	0.10
Cohort interaction: School percent FRPL	-0.03	0.03	0.30
Cohort interaction: School report card rating – on one scale	-0.44	0.22	0.05
Cohort interaction: School percent non-white	0.01	0.04	0.88
Cohort interaction: School percent ELL	0.02	0.02	0.33
Cohort interaction: School percent Special Education	-0.03	0.05	0.58
Cohort interaction: District A block 3	1.87	0.71	0.01

Exhibit C-2. Impact of the NTC Model on Establishing a Culture for Learning – Both Cohorts and Districts Combined (concluded)

	Estimate	Standard Error	p-value
Cohort interaction: District A block 2	1.74	0.63	0.01
Cohort interaction: District B block 5	0.14	0.82	0.86
Cohort interaction: District B block 7	-0.17	1.17	0.89
Cohort interaction: District B block 8	-1.44	0.78	0.07
Cohort interaction: District B block 6	0.12	0.81	0.88
District-by-cohort interactions			
District by cohort interaction	-0.97	0.73	0.18
District by cohort interaction: Baseline score	-0.57	0.30	0.06
District by cohort interaction: Teacher is female	2.25	0.89	0.01
District by cohort interaction: Teacher race is black	1.46	0.82	0.07
District by cohort interaction: Teacher has only partial certification	-1.30	1.10	0.24
District by cohort interaction: School percent FRPL	0.01	0.05	0.91
District by cohort interaction: School report card rating - on one scale	-0.67	0.44	0.12
District by cohort interaction: School percent non-white	-0.11	0.09	0.20
District by cohort interaction: School percent ELL	0.01	0.03	0.77
District by cohort interaction: School percent Special Education	-0.13	0.10	0.21
Constant	0.92	0.21	<0.001
Random effects			
School	0.40		
Teacher	0.33		
n			
School	*108*		
Teacher	*159*		

Exhibit C-3. Impact of the NTC Model on Managing Classroom Procedures – Both Cohorts and Districts Combined

	Estimate	Standard Error	p-value
Treatment status	0.13	0.16	0.45
Baseline score	0.08	0.09	0.43
Teacher controls			
Teacher is female CENTERED	0.01	0.23	0.95
Teacher race is black CENTERED	0.07	0.20	0.71
Teacher has only partial certification CENTERED	-0.07	0.26	0.78
School controls			
School percent FRPL CENTERED	-0.01	0.01	0.27
School report card rating - on one scale CENTERED	0.04	0.10	0.66
School percent non-white CENTERED	0.02	0.02	0.34
School percent ELL CENTERED	0.01	0.01	0.44
School percent Special Education CENTERED	-0.04	0.03	0.10
Blocking variables			
District A block 3	-0.40	0.36	0.27
District A block 2	-0.43	0.36	0.23
District B block 5	-0.32	0.31	0.30
District B block 7	-0.09	0.56	0.87
District B block 8	0.36	0.31	0.23
District B block 6	<0.001	0.33	1.00
Interactions with district			
Centered district indicator	0.14	0.33	0.68
District interaction: Baseline score	<0.001	0.19	0.98
District interaction: Teacher is female	-0.53	0.46	0.25
District interaction: Teacher race is black	-0.02	0.41	0.97
District interaction: Teacher has only partial certification	-0.85	0.51	0.10
District interaction: School percent FRPL	-0.04	0.02	0.07
District interaction: School report card rating – on one scale	<0.001	0.20	0.99
District interaction: School percent non-white	0.07	0.04	0.05
District interaction: School percent ELL	0.02	0.02	0.33
District interaction: School percent Special Education	-0.04	0.05	0.40
Interactions with cohort			
Centered cohort indicator	0.36	0.32	0.26
Cohort interaction: Baseline score	0.23	0.19	0.23
Cohort interaction: Teacher is female	1.02	0.47	0.03
Cohort interaction: Teacher race is black	-0.17	0.39	0.67
Cohort interaction: Teacher has only partial certification	-0.59	0.51	0.25
Cohort interaction: School percent FRPL	-0.03	0.02	0.26
Cohort interaction: School report card rating – on one scale	-0.22	0.20	0.28
Cohort interaction: School percent non-white	0.01	0.04	0.72
Cohort interaction: School percent ELL	0.03	0.02	0.05
Cohort interaction: School percent Special Education	<0.001	0.05	0.94
Cohort interaction: District A block 3	0.18	0.71	0.80

Exhibit C-3. Impact of the NTC Model on Managing Classroom Procedures – Both Cohorts and Districts Combined (concluded)

	Estimate	Standard Error	p-value
Cohort interaction: District A block 2	0.22	0.70	0.76
Cohort interaction: District B block 5	-0.11	0.61	0.85
Cohort interaction: District B block 7	-1.11	1.17	0.34
Cohort interaction: District B block 8	-0.95	0.59	0.11
Cohort interaction: District B block 6	-1.40	0.64	0.03
District-by-cohort interactions			
District by cohort interaction	0.77	0.65	0.24
District by cohort interaction: Baseline score	0.37	0.38	0.34
District by cohort interaction: Teacher is female	0.09	0.92	0.92
District by cohort interaction: Teacher race is black	-0.88	0.81	0.27
District by cohort interaction: Teacher has only partial certification	0.66	1.02	0.51
District by cohort interaction: School percent FRPL	0.03	0.05	0.49
District by cohort interaction: School report card rating – on one scale	-0.79	0.41	0.06
District by cohort interaction: School percent non-white	-0.10	0.08	0.21
District by cohort interaction: School percent ELL	0.03	0.03	0.33
District by cohort interaction: School percent Special Education	0.05	0.11	0.67
Constant	0.86	0.17	<0.001
Random effects			
School	<0.001		
Teacher	0.45		
n			
School	*102*		
Teacher	*139*		

Exhibit C-4. Impact of the NTC Model on Managing Student Behavior – Both Cohorts and Districts Combined

	Estimate	Standard Error	p-value
Treatment status	0.28	0.18	0.12
Baseline score	0.11	0.09	0.21
Teacher controls			
Teacher is female CENTERED	0.28	0.20	0.16
Teacher race is black CENTERED	-0.03	0.23	0.90
Teacher has only partial certification CENTERED	0.04	0.20	0.85
School controls			
School percent FRPL CENTERED	-0.01	0.01	0.71
School report card rating - on one scale CENTERED	0.18	0.10	0.07
School percent non-white CENTERED	0.01	0.02	0.47
School percent ELL CENTERED	<0.001	0.01	0.92
School percent Special Education CENTERED	-0.01	0.02	0.77
Blocking variables			
District A block 3	-0.14	0.31	0.65
District A block 2	0.31	0.31	0.30
District B block 5	-0.92	0.34	0.01
District B block 7	-1.29	0.41	<0.001
District B block 8	-0.10	0.23	0.66
District B block 6	-1.31	0.32	<0.001
Interactions with district			
Centered district indicator	-0.96	0.27	<0.001
District interaction: Baseline score	0.03	0.18	0.87
District interaction: Teacher is female	-0.15	0.39	0.70
District interaction: Teacher race is black	0.79	0.45	0.08
District interaction: Teacher has only partial certification	-0.80	0.39	0.04
District interaction: School percent FRPL	<0.001	0.03	0.99
District interaction: School report card rating – on one scale	0.16	0.20	0.41
District interaction: School percent non-white	0.03	0.04	0.43
District interaction: School percent ELL	0.01	0.02	0.44
District interaction: School percent Special Education	0.02	0.04	0.70
Interactions with cohort			
Centered cohort indicator	0.25	0.26	0.33
Cohort interaction: Baseline score	-0.09	0.18	0.62
Cohort interaction: Teacher is female	-0.17	0.41	0.67
Cohort interaction: Teacher race is black	-0.26	0.43	0.54
Cohort interaction: Teacher has only partial certification	-0.09	0.37	0.81
Cohort interaction: School percent FRPL	-0.03	0.02	0.19
Cohort interaction: School report card rating – on one scale	-0.26	0.19	0.17
Cohort interaction: School percent non-white	0.03	0.04	0.50
Cohort interaction: School percent ELL	-0.02	0.01	0.24
Cohort interaction: School percent Special Education	-0.08	0.04	0.05
Cohort interaction: District A block 3	-1.67	0.61	0.01

Exhibit C-4. Impact of the NTC Model on Managing Student Behavior – Both Cohorts and Districts Combined (concluded)

	Estimate	Standard Error	p-value
Cohort interaction: District A block 2	-1.66	0.57	<0.001
Cohort interaction: District B block 5	1.11	0.68	0.10
Cohort interaction: District B block 7	0.38	0.85	0.65
Cohort interaction: District B block 8	-1.24	0.48	0.01
Cohort interaction: District B block 6	-1.66	0.63	0.01
District-by-cohort interactions			
District by cohort interaction	1.11	0.58	0.06
District by cohort interaction: Baseline score	0.33	0.35	0.35
District by cohort interaction: Teacher is female	0.12	0.81	0.88
District by cohort interaction: Teacher race is black	-0.78	0.92	0.39
District by cohort interaction: Teacher has only partial certification	1.11	0.74	0.13
District by cohort interaction: School percent FRPL	0.06	0.05	0.23
District by cohort interaction: School report card rating – on one scale	-0.55	0.38	0.15
District by cohort interaction: School percent non-white	-0.12	0.08	0.11
District by cohort interaction: School percent ELL	-0.03	0.03	0.33
District by cohort interaction: School percent Special Education	-0.12	0.08	0.13
Constant	0.45	0.15	<0.001
Random effects			
School	<0.001		
Teacher	0.61		
n			
School	*108*		
Teacher	*159*		

Exhibit C-5. Impact of the NTC Model on Communicating with Students – Both Cohorts and Districts Combined

	Estimate	Standard Error	p-value
Treatment status	0.01	0.19	0.96
Baseline score	0.09	0.09	0.29
School controls			
Teacher is female CENTERED	-0.12	0.23	0.62
Teacher race is black CENTERED	-0.41	0.23	0.08
Teacher has only partial certification CENTERED	0.04	0.32	0.91
School controls			
School percent FRPL CENTERED	<0.001	0.01	0.76
School report card rating - on one scale CENTERED	0.08	0.12	0.51
School percent non-white CENTERED	<0.001	0.02	0.95
School percent ELL CENTERED	<0.001	0.01	0.71
School percent Special Education CENTERED	0.01	0.03	0.68
Blocking variables			
District A block 3	-0.16	0.41	0.70
District A block 2	-0.39	0.39	0.32
District B block 5	-0.96	0.40	0.02
District B block 7	-0.55	0.54	0.31
District B block 8	-0.41	0.41	0.32
District B block 6	-1.14	0.42	0.01
Interactions with district			
Centered district indicator	-1.08	0.40	0.01
District interaction: Baseline score	0.26	0.18	0.14
District interaction: Teacher is female	0.04	0.47	0.94
District interaction: Teacher race is black	0.35	0.48	0.46
District interaction: Teacher has only partial certification	-0.02	0.62	0.97
District interaction: School percent FRPL	-0.01	0.03	0.75
District interaction: School report card rating – on one scale	<0.001	0.24	0.99
District interaction: School percent non-white	0.05	0.05	0.29
District interaction: School percent ELL	-0.02	0.02	0.40
District interaction: School percent Special Education	0.06	0.06	0.27
Interactions with cohort			
Centered cohort indicator	0.42	0.39	0.28
Cohort interaction: Baseline score	0.18	0.18	0.31
Cohort interaction: Teacher is female	-0.44	0.47	0.35
Cohort interaction: Teacher race is black	0.04	0.47	0.93
Cohort interaction: Teacher has only partial certification	0.54	0.62	0.39
Cohort interaction: School percent FRPL	0.03	0.03	0.31
Cohort interaction: School report card rating – on one scale	-0.02	0.24	0.94
Cohort interaction: School percent non-white	-0.03	0.05	0.46
Cohort interaction: School percent ELL	0.01	0.02	0.50
Cohort interaction: School percent Special Education	-0.02	0.06	0.77
Cohort interaction: District A block 3	0.90	0.80	0.26

Exhibit C-5. Impact of the NTC Model on Communicating with Students – Both Cohorts and Districts Combined (concluded)

	Estimate	Standard Error	p-value
Cohort interaction: District A block 2	1.10	0.75	0.14
Cohort interaction: District B block 5	-0.68	0.81	0.40
Cohort interaction: District B block 7	-0.08	1.09	0.94
Cohort interaction: District B block 8	-1.84	0.79	0.02
Cohort interaction: District B block 6	-0.83	0.81	0.31
District-by-cohort interactions			
District by cohort interaction	-1.23	0.79	0.12
District by cohort interaction: Baseline score	0.14	0.35	0.70
District by cohort interaction: Teacher is female	2.05	0.94	0.03
District by cohort interaction: Teacher race is black	0.28	0.96	0.77
District by cohort interaction: Teacher has only partial certification	-0.60	1.25	0.63
District by cohort interaction: School percent FRPL	0.02	0.05	0.75
District by cohort interaction: School report card rating – on one scale	-0.45	0.48	0.34
District by cohort interaction: School percent non-white	-0.06	0.09	0.50
District by cohort interaction: School percent ELL	0.02	0.04	0.64
District by cohort interaction: School percent Special Education	-0.02	0.11	0.84
Constant	0.64	0.20	<0.001
Random effects			
School	0.07		
Teacher	0.66		
n			
School	*107*		
Teacher	*157*		

Exhibit C-6. Impact of the NTC Model on Using Questioning and Discussion Techniques – Both Cohorts and Districts Combined

	Estimate	Standard Error	p-value
Treatment status	0.21	0.18	0.25
Baseline score	0.05	0.10	0.62
Teacher variables			
Teacher is female CENTERED	-0.03	0.23	0.91
Teacher race is black CENTERED	0.13	0.22	0.57
Teacher has only partial certification CENTERED	-0.38	0.30	0.20
School variables			
School percent FRPL CENTERED	-0.01	0.01	0.47
School report card rating - on one scale CENTERED	0.13	0.12	0.26
School percent non-white CENTERED	0.01	0.02	0.58
School percent ELL CENTERED	<0.001	0.01	0.72
School percent Special Education CENTERED	0.01	0.03	0.76
Blocking variables			
District A block 3	-0.78	0.45	0.08
District A block 2	0.18	0.39	0.65
District B block 5	-0.77	0.39	0.05
District B block 7	-0.99	0.56	0.08
District B block 8	-0.50	0.39	0.20
District B block 6	-1.34	0.40	<0.001
Interactions by district			
Centered district indicator	-0.94	0.39	0.02
District interaction: Baseline score	-0.18	0.19	0.35
District interaction: Teacher is female	0.19	0.45	0.67
District interaction: Teacher race is black	0.04	0.45	0.93
District interaction: Teacher has only partial certification	-0.13	0.59	0.83
District interaction: School percent FRPL	-0.03	0.03	0.31
District interaction: School report card rating – on one scale	0.16	0.23	0.50
District interaction: School percent non-white	0.06	0.04	0.16
District interaction: School percent ELL	<0.001	0.02	0.84
District interaction: School percent Special Education	0.09	0.05	0.11
Interactions by cohort			
Centered cohort indicator	0.17	0.37	0.65
Cohort interaction: Baseline score	-0.06	0.19	0.76
Cohort interaction: Teacher is female	0.38	0.45	0.41
Cohort interaction: Teacher race is black	-0.23	0.44	0.61
Cohort interaction: Teacher has only partial certification	0.82	0.60	0.17
Cohort interaction: School percent FRPL	0.02	0.03	0.34
Cohort interaction: School report card rating – on one scale	-0.10	0.23	0.68
Cohort interaction: School percent non-white	-0.04	0.04	0.40
Cohort interaction: School percent ELL	-0.01	0.02	0.74
Cohort interaction: School percent Special Education	-0.12	0.05	0.02
Cohort interaction: District A block 3	0.96	0.88	0.27

Exhibit C-6. Impact of the NTC Model on Using Questioning and Discussion Techniques – Both Cohorts and Districts Combined (concluded)

	Estimate	Standard Error	p-value
Cohort interaction: District A block 2	0.28	0.74	0.70
Cohort interaction: District B block 5	0.50	0.77	0.51
Cohort interaction: District B block 7	0.11	1.12	0.92
Cohort interaction: District B block 8	-0.39	0.74	0.60
Cohort interaction: District B block 6	-0.64	0.77	0.41
District-by-cohort interactions			
District by cohort interaction	-0.83	0.77	0.28
District by cohort interaction: Baseline score	0.69	0.39	0.07
District by cohort interaction: Teacher is female	-0.07	0.91	0.93
District by cohort interaction: Teacher race is black	0.71	0.90	0.43
District by cohort interaction: Teacher has only partial certification	-0.74	1.20	0.54
District by cohort interaction: School percent FRPL	0.03	0.05	0.59
District by cohort interaction: School report card rating – on one scale	0.03	0.46	0.95
District by cohort interaction: School percent non-white	-0.08	0.09	0.37
District by cohort interaction: School percent ELL	0.01	0.04	0.69
District by cohort interaction: School percent Special Education	-0.12	0.11	0.27
Constant	0.89	0.20	<0.001
Random effects			
School	0.10		
Teacher	0.59		
n			
School	*107*		
Teacher	*157*		

Exhibit C-7. Impact of the NTC Model on Engaging Students in Learning – Both Cohorts and Districts Combined

	Estimate	Standard Error	p-value
Treatment status	0.15	0.17	0.37
Baseline score	0.03	0.09	0.70
Teacher variables			
Teacher is female CENTERED	0.03	0.22	0.90
Teacher race is black CENTERED	0.01	0.21	0.97
Teacher has only partial certification CENTERED	-0.54	0.29	0.07
School variables			
School percent FRPL CENTERED	-0.02	0.01	0.16
School report card rating - on one scale CENTERED	0.04	0.11	0.71
School percent non-white CENTERED	0.02	0.02	0.34
School percent ELL CENTERED	0.01	0.01	0.32
School percent Special Education CENTERED	<0.001	0.03	0.86
Blocking variables			
District A block 3	-0.53	0.39	0.17
District A block 2	-0.16	0.36	0.66
District B block 5	-0.19	0.39	0.62
District B block 7	-0.97	0.50	0.05
District B block 8	-0.14	0.40	0.72
District B block 6	-0.72	0.38	0.06
Interactions by district			
Centered district indicator	-0.32	0.39	0.41
District interaction: Baseline score	0.03	0.18	0.87
District interaction: Teacher is female	-0.04	0.45	0.92
District interaction: Teacher race is black	0.51	0.43	0.24
District interaction: Teacher has only partial certification	-0.04	0.58	0.95
District interaction: School percent FRPL	-0.02	0.02	0.47
District interaction: School report card rating – on one scale	0.06	0.22	0.80
District interaction: School percent non-white	0.02	0.04	0.68
District interaction: School percent ELL	0.03	0.02	0.09
District interaction: School percent Special Education	0.10	0.05	0.07
Interactions by cohort			
Centered cohort indicator	0.40	0.38	0.28
Cohort interaction: Baseline score	-0.25	0.18	0.17
Cohort interaction: Teacher is female	0.69	0.45	0.12
Cohort interaction: Teacher race is black	-0.44	0.42	0.30
Cohort interaction: Teacher has only partial certification	0.80	0.58	0.17
Cohort interaction: School percent FRPL	<0.001	0.02	0.97
Cohort interaction: School report card rating – on one scale	-0.34	0.22	0.12
Cohort interaction: School percent non-white	-0.02	0.04	0.56
Cohort interaction: School percent ELL	0.01	0.02	0.57
Cohort interaction: School percent Special Education	-0.06	0.05	0.23
Cohort interaction: District A block 3	0.66	0.77	0.39

Exhibit C-7. Impact of the NTC Model on Engaging Students in Learning – Both Cohorts and Districts Combined (concluded)

	Estimate	Standard Error	p-value
Cohort interaction: District A block 2	0.09	0.69	0.89
Cohort interaction: District B block 5	0.46	0.78	0.56
Cohort interaction: District B block 7	0.37	1.01	0.72
Cohort interaction: District B block 8	-1.57	0.78	0.04
Cohort interaction: District B block 6	-0.81	0.73	0.27
District-by-cohort interactions			
District by cohort interaction	-0.69	0.77	0.37
District by cohort interaction: Baseline score	0.40	0.36	0.26
District by cohort interaction: Teacher is female	0.83	0.89	0.35
District by cohort interaction: Teacher race is black	0.37	0.87	0.67
District by cohort interaction: Teacher has only partial certification	-0.23	1.17	0.84
District by cohort interaction: School percent FRPL	0.02	0.05	0.73
District by cohort interaction: School report card rating – on one scale	-0.47	0.44	0.28
District by cohort interaction: School percent non-white	-0.07	0.08	0.38
District by cohort interaction: School percent ELL	0.01	0.03	0.88
District by cohort interaction: School percent Special Education	-0.08	0.10	0.43
Constant	0.70	0.20	<0.001
Random effects			
School	0.04		
Teacher	0.59		
n			
School	*108*		
Teacher	*157*		

Exhibit C-8. Impact of the NTC Model on Using Assessment in Instruction – Both Cohorts and Districts Combined (continued)

	Estimate	Standard Error	p-value
Treatment status	0.06	0.18	0.74
Baseline score	-0.01	0.07	0.92
Teacher controls			
Teacher is female CENTERED	0.15	0.19	0.41
Teacher race is black CENTERED	0.02	0.25	0.93
Teacher has only partial certification CENTERED	-0.11	0.20	0.57
School controls			
School percent FRPL CENTERED	0.01	0.01	0.72
School report card rating - on one scale CENTERED	-0.02	0.09	0.82
School percent non-white CENTERED	-0.02	0.02	0.41
School percent ELL CENTERED	<0.001	0.01	0.99
School percent Special Education CENTERED	-0.03	0.02	0.20
Blocking variables			
District A block 3	-0.90	0.30	<0.001
District A block 2	-0.27	0.39	0.49
District B block 5	-0.99	0.33	<0.001
District B block 7	-1.10	0.56	0.05
District B block 8	-0.01	0.23	0.98
District B block 6	-1.78	0.38	<0.001
Interactions with district			
Centered district indicator	-1.22	0.34	<0.001
District interaction: Baseline score	0.11	0.14	0.45
District interaction: Teacher is female	-0.35	0.37	0.35
District interaction: Teacher race is black	-0.02	0.51	0.97
District interaction: Teacher has only partial certification	-0.33	0.37	0.38
District interaction: School percent FRPL	-0.01	0.03	0.75
District interaction: School report card rating – on one scale	0.14	0.19	0.46
District interaction: School percent non-white	0.05	0.05	0.29
District interaction: School percent ELL	0.02	0.02	0.32
District interaction: School percent Special Education	0.04	0.05	0.40
Interactions with cohort			
Centered cohort indicator	-0.27	0.28	0.32
Cohort interaction: Baseline score	0.09	0.14	0.53
Cohort interaction: Teacher is female	0.26	0.37	0.48
Cohort interaction: Teacher race is black	-0.95	0.47	0.04
Cohort interaction: Teacher has only partial certification	-0.46	0.38	0.22
Cohort interaction: School percent FRPL	-0.01	0.03	0.72
Cohort interaction: School report card rating – on one scale	0.15	0.19	0.45
Cohort interaction: School percent non-white	0.06	0.05	0.22
Cohort interaction: School percent ELL	0.01	0.02	0.48
Cohort interaction: School percent Special Education	0.01	0.04	0.89
Cohort interaction: District A block 3	0.39	0.60	0.52

Exhibit C-8. Impact of the NTC Model on Using Assessment in Instruction – Both Cohorts and Districts Combined (concluded)

	Estimate	Standard Error	p-value
Cohort interaction: District A block 2	1.46	0.95	0.12
Cohort interaction: District B block 5	1.06	0.63	0.09
Cohort interaction: District B block 7	-1.62	1.21	0.18
Cohort interaction: District B block 8	-1.55	0.52	<0.001
Cohort interaction: District B block 6	-2.55	0.64	<0.001
District-by-cohort interactions			
District by cohort interaction	-0.01	0.62	0.99
District by cohort interaction: Baseline score	0.40	0.28	0.15
District by cohort interaction: Teacher is female	0.15	0.74	0.84
District by cohort interaction: Teacher race is black	1.98	1.00	0.05
District by cohort interaction: Teacher has only partial certification	0.96	0.76	0.21
District by cohort interaction: School percent FRPL	0.08	0.06	0.20
District by cohort interaction: School report card rating – on one scale	0.04	0.35	0.90
District by cohort interaction: School percent non-white	-0.19	0.10	0.06
District by cohort interaction: School percent ELL	0.02	0.03	0.61
District by cohort interaction: School percent Special Education	-0.05	0.09	0.53
Constant	1.05	0.16	<0.001
Random effects			
School	<0.001		
Teacher	0.66		
n			
School	*107*		
Teacher	*158*		

Both Cohorts Combined, District A

Exhibit C-9. Impact of the NTC Model on Creating an Environment of Respect and Rapport – Both Cohorts Combined, District A

	Estimate	Standard Error	p-value
Treatment status	-0.05	0.22	0.83
Baseline score	0.31	0.13	0.01
Teacher variables			
Teacher is female CENTERED	0.05	0.26	0.84
Teacher race is black CENTERED	-0.03	0.23	0.91
Teacher has only partial certification CENTERED	-0.28	0.23	0.22
School variables			
School percent FRPL CENTERED	-0.02	0.01	0.11
School report card rating - on one scale CENTERED	-0.13	0.19	0.48
School percent non-white CENTERED	0.02	0.02	0.24
School percent ELL CENTERED	0.01	0.01	0.33
School percent Special Education CENTERED	0.01	0.05	0.77
Blocking variables			
District A block 3	0.52	0.37	0.16
District A block 2	-0.08	0.37	0.84
Interactions with cohort			
Centered cohort indicator	0.10	0.33	0.76
Cohort interaction: Baseline score	-0.46	0.25	0.07
Cohort interaction: Teacher is female	-0.81	0.52	0.12
Cohort interaction: Teacher race is black	-0.25	0.45	0.58
Cohort interaction: Teacher has only partial certification	-0.10	0.44	0.82
Cohort interaction: School percent FRPL	-0.02	0.03	0.33
Cohort interaction: School report card rating – on one scale	-0.36	0.38	0.34
Cohort interaction: School percent non-white	-0.01	0.03	0.76
Cohort interaction: School percent ELL	0.01	0.03	0.78
Cohort interaction: School percent Special Education	-0.16	0.09	0.08
Cohort interaction: District A block 3	-1.21	0.73	0.10
Cohort interaction: District A block 2	0.04	0.71	0.96
Constant	0.13	0.20	0.53
Random effects			
School	0.04	0.14	0.75
Teacher	0.57	0.16	<0.001
n			
School	*36*		
Teacher	*44*		

Exhibit C-10. Impact of the NTC Model on Establishing a Culture for Learning – Both Cohorts Combined, District A

	Estimate	Standard Error	p-value
Treatment status	-0.11	0.31	0.72
Baseline score	0.23	0.11	0.03
Teacher variables			
Teacher is female CENTERED	-0.08	0.25	0.76
Teacher race is black CENTERED	0.28	0.22	0.20
Teacher has only partial certification CENTERED	-0.18	0.24	0.47
School variables			
School percent FRPL CENTERED	-0.01	0.02	0.40
School report card rating - on one scale CENTERED	0.06	0.22	0.80
School percent non-white CENTERED	0.02	0.02	0.27
School percent ELL CENTERED	-0.01	0.02	0.45
School percent Special Education CENTERED	-0.06	0.06	0.30
Blocking variables			
District A block 3	-0.81	0.44	0.06
District A block 2	-0.58	0.43	0.18
Interactions by cohort			
Centered cohort indicator	-0.57	0.34	0.10
Cohort interaction: Baseline score	-0.33	0.23	0.17
Cohort interaction: Teacher is female	1.05	0.50	0.03
Cohort interaction: Teacher race is black	0.41	0.44	0.35
Cohort interaction: Teacher has only partial certification	0.22	0.45	0.63
Cohort interaction: School percent FRPL	-0.02	0.03	0.44
Cohort interaction: School report card rating – on one scale	-0.78	0.42	0.07
Cohort interaction: School percent non-white	-0.05	0.03	0.11
Cohort interaction: School percent ELL	0.02	0.03	0.48
Cohort interaction: School percent Special Education	-0.09	0.10	0.41
Cohort interaction: District A block 3	1.84	0.79	0.02
Cohort interaction: District A block 2	1.74	0.72	0.02
Constant	0.50	0.27	0.06
Random effects			
School	0.46	0.19	0.02
Teacher	0.43	0.12	<0.001
n			
School	*47*		
Teacher	*77*		

Exhibit C-11. Impact of the NTC Model on Managing Classroom Procedures – Both Cohorts Combined, District A

	Estimate	Standard Error	p-value
Treatment status	-0.36	0.28	0.20
Baseline score	-0.19	0.08	0.01
Teacher variables			
Teacher is female CENTERED	-0.54	0.17	<0.001
Teacher race is black CENTERED	0.06	0.16	0.71
Teacher has only partial certification CENTERED	-0.47	0.17	0.01
School variables			
School percent FRPL CENTERED	-0.04	0.01	0.01
School report card rating - on one scale CENTERED	0.38	0.19	0.05
School percent non-white CENTERED	0.08	0.02	<0.001
School percent ELL CENTERED	0.01	0.02	0.68
School percent Special Education CENTERED	-0.21	0.05	<0.001
Blocking variables			
District A block 3	-1.07	0.41	0.01
District A block 2	-0.08	0.37	0.83
Interactions with cohort			
Centered cohort indicator	0.87	0.22	<0.001
Cohort interaction: Baseline score	0.35	0.20	0.07
Cohort interaction: Teacher is female	0.74	0.38	0.05
Cohort interaction: Teacher race is black	-1.14	0.32	<0.001
Cohort interaction: Teacher has only partial certification	-0.22	0.30	0.46
Cohort interaction: School percent FRPL	-0.04	0.01	<0.001
Cohort interaction: School report card rating – on one scale	-1.54	0.29	<0.001
Cohort interaction: School percent non-white	-0.03	0.01	0.02
Cohort interaction: School percent ELL	0.01	0.02	0.61
Cohort interaction: School percent Special Education	0.20	0.08	0.01
Cohort interaction: District A block 3	1.24	0.63	0.05
Cohort interaction: District A block 2	-1.04	0.42	0.01
Constant	1.09	0.25	<0.001
Random effects			
School	0.67		
Teacher	0.05		
n			
School	*43*		
Teacher	*61*		

Exhibit C-12. Impact of the NTC Model on Managing Student Behavior – Both Cohorts Combined, District A

	Estimate	Standard Error	p-value
Treatment status	0.26	0.24	0.27
Baseline score	0.12	0.12	0.32
Teacher variables			
Teacher is female CENTERED	0.20	0.24	0.42
Teacher race is black CENTERED	0.36	0.20	0.07
Teacher has only partial certification CENTERED	-0.35	0.20	0.09
School variables			
School percent FRPL CENTERED	<0.001	0.02	0.88
School report card rating - on one scale CENTERED	0.27	0.17	0.12
School percent non-white CENTERED	0.03	0.02	0.06
School percent ELL CENTERED	<0.001	0.01	0.76
School percent Special Education CENTERED	<0.001	0.03	1.00
Blocking variables			
District A block 3	-0.13	0.32	0.70
District A block 2	0.33	0.31	0.29
Interacts with cohorts			
Centered cohort indicator	0.77	0.31	0.01
Cohort interaction: Baseline score	0.07	0.23	0.77
Cohort interaction: Teacher is female	-0.10	0.51	0.84
Cohort interaction: Teacher race is black	-0.64	0.43	0.14
Cohort interaction: Teacher has only partial certification	0.49	0.40	0.21
Cohort interaction: School percent FRPL	-0.01	0.02	0.77
Cohort interaction: School report card rating – on one scale	-0.54	0.33	0.11
Cohort interaction: School percent non-white	-0.03	0.02	0.10
Cohort interaction: School percent ELL	-0.03	0.02	0.19
Cohort interaction: School percent Special Education	-0.14	0.07	0.05
Cohort interaction: District A block 3	-1.69	0.63	0.01
Cohort interaction: District A block 2	-1.63	0.58	0.01
Constant	-0.05	0.21	0.83
Random effects			
School	<0.001		
Teacher	0.59		
n			
School	*47*		
Teacher	*77*		

Exhibit C-13. Impact of the NTC Model on Communicating with Students – Both Cohorts Combined, District A

	Estimate	Standard Error	p-value
Treatment status	0.19	0.26	0.48
Baseline score	0.21	0.11	0.07
Teacher variables			
Teacher is female CENTERED	-0.09	0.26	0.74
Teacher race is black CENTERED	-0.23	0.25	0.36
Teacher has only partial certification CENTERED	-0.08	0.25	0.76
School variables			
School percent FRPL CENTERED	-0.01	0.01	0.60
School report card rating - on one scale CENTERED	0.04	0.22	0.84
School percent non-white CENTERED	0.02	0.02	0.20
School percent ELL CENTERED	-0.01	0.02	0.53
School percent Special Education CENTERED	0.05	0.05	0.38
Blocking variables			
District A block 3	-0.04	0.42	0.93
District A block 2	-0.38	0.41	0.35
Interactions with cohort			
Centered cohort indicator	-0.21	0.35	0.55
Cohort interaction: Baseline score	0.19	0.23	0.40
Cohort interaction: Teacher is female	0.57	0.53	0.28
Cohort interaction: Teacher race is black	0.21	0.49	0.67
Cohort interaction: Teacher has only partial certification	0.35	0.47	0.46
Cohort interaction: School percent FRPL	0.04	0.03	0.16
Cohort interaction: School report card rating – on one scale	-0.17	0.42	0.68
Cohort interaction: School percent non-white	-0.07	0.03	0.03
Cohort interaction: School percent ELL	0.03	0.03	0.44
Cohort interaction: School percent Special Education	-0.01	0.10	0.93
Cohort interaction: District A block 3	0.81	0.82	0.32
Cohort interaction: District A block 2	1.09	0.73	0.14
Constant	0.01	0.24	0.96
Random effects			
School	0.21		
Teacher	0.56		
n			
School	*47*		
Teacher	*75*		

Exhibit C-14. Impact of the NTC Model on Using Questioning and Discussion Techniques – Both Cohorts Combined, District A

	Estimate	Standard Error	p-value
Treatment status	0.12	0.31	0.68
Baseline score	-0.10	0.14	0.48
Teacher variables			
Teacher is female CENTERED	-0.17	0.22	0.44
Teacher race is black CENTERED	0.01	0.20	0.96
Teacher has only partial certification CENTERED	-0.35	0.23	0.12
School variables			
School percent FRPL CENTERED	-0.03	0.02	0.09
School report card rating - on one scale CENTERED	0.20	0.22	0.36
School percent non-white CENTERED	0.05	0.02	0.01
School percent ELL CENTERED	<0.001	0.02	0.97
School percent Special Education CENTERED	0.07	0.05	0.20
Blocking variables			
District A block 3	-0.82	0.47	0.08
District A block 2	0.02	0.44	0.96
Interactions with cohort			
Centered cohort indicator	-0.61	0.32	0.05
Cohort interaction: Baseline score	0.22	0.27	0.41
Cohort interaction: Teacher is female	0.12	0.44	0.78
Cohort interaction: Teacher race is black	0.29	0.39	0.46
Cohort interaction: Teacher has only partial certification	0.77	0.42	0.07
Cohort interaction: School percent FRPL	0.06	0.02	0.01
Cohort interaction: School report card rating – on one scale	0.17	0.39	0.66
Cohort interaction: School percent non-white	-0.11	0.03	<0.001
Cohort interaction: School percent ELL	0.01	0.03	0.86
Cohort interaction: School percent Special Education	-0.16	0.10	0.09
Cohort interaction: District A block 3	1.16	0.86	0.18
Cohort interaction: District A block 2	-0.08	0.66	0.91
Constant	0.62	0.27	0.02
Random effects			
School	0.66		
Teacher	0.26		
n			
School	*47*		
Teacher	*76*		

Exhibit C-15. Impact of the NTC Model on Engaging Students in Learning – Both Cohorts Combined, District A

	Estimate	Standard Error	p-value
Treatment status	0.32	0.26	0.21
Baseline score	0.05	0.14	0.71
Teacher variables			
Teacher is female CENTERED	<0.001	0.27	0.99
Teacher race is black CENTERED	0.27	0.26	0.30
Teacher has only partial certification CENTERED	-0.63	0.26	0.02
School variables			
School percent FRPL CENTERED	-0.03	0.01	0.07
School report card rating - on one scale CENTERED	0.03	0.21	0.87
School percent non-white CENTERED	0.03	0.02	0.14
School percent ELL CENTERED	0.02	0.02	0.14
School percent Special Education CENTERED	0.06	0.05	0.29
Blocking variables			
District A block 3	-0.48	0.44	0.27
District A block 2	-0.12	0.40	0.76
Interactions with cohort			
Centered cohort indicator	0.08	0.37	0.82
Cohort interaction: Baseline score	-0.05	0.28	0.86
Cohort interaction: Teacher is female	1.03	0.55	0.06
Cohort interaction: Teacher race is black	-0.29	0.51	0.58
Cohort interaction: Teacher has only partial certification	0.70	0.50	0.16
Cohort interaction: School percent FRPL	0.01	0.03	0.68
Cohort interaction: School report card rating – on one scale	-0.57	0.42	0.18
Cohort interaction: School percent non-white	-0.06	0.03	0.05
Cohort interaction: School percent ELL	0.02	0.03	0.61
Cohort interaction: School percent Special Education	-0.10	0.11	0.32
Cohort interaction: District A block 3	0.57	0.86	0.51
Cohort interaction: District A block 2	0.06	0.76	0.94
Constant	0.47	0.23	0.04
Random effects			
School	0.10		
Teacher	0.68		
n			
School	*47*		
Teacher	*76*		

Exhibit C-16. Impact of the NTC Model on Using Assessment in Instruction – Both Cohorts Combined, District A

	Estimate	Standard Error	p-value
Treatment status	0.21	0.26	0.42
Baseline score	0.05	0.13	0.69
Teacher variables			
Teacher is female CENTERED	-0.12	0.25	0.63
Teacher race is black CENTERED	<0.001	0.23	1.00
Teacher has only partial certification CENTERED	-0.48	0.24	0.05
School variables			
School percent FRPL CENTERED	<0.001	0.01	0.77
School report card rating - on one scale CENTERED	0.01	0.20	0.95
School percent non-white CENTERED	0.01	0.02	0.69
School percent ELL CENTERED	0.01	0.02	0.63
School percent Special Education CENTERED	<0.001	0.05	0.94
Blocking variables			
District A block 3	-0.90	0.40	0.02
District A block 2	-0.30	0.39	0.45
Interactions with cohort			
Centered cohort indicator	-0.31	0.37	0.39
Cohort interaction: Baseline score	0.29	0.24	0.22
Cohort interaction: Teacher is female	0.38	0.50	0.44
Cohort interaction: Teacher race is black	0.08	0.45	0.85
Cohort interaction: Teacher has only partial certification	<0.001	0.44	0.99
Cohort interaction: School percent FRPL	0.03	0.03	0.17
Cohort interaction: School report card rating – on one scale	0.04	0.39	0.92
Cohort interaction: School percent non-white	-0.05	0.03	0.10
Cohort interaction: School percent ELL	0.03	0.03	0.38
Cohort interaction: School percent Special Education	<0.001	0.10	0.97
Cohort interaction: District A block 3	0.58	0.76	0.45
Cohort interaction: District A block 2	1.09	0.71	0.13
Constant	0.41	0.24	0.09
Random effects			
School	0.18	0.24	0.47
Teacher	0.52	0.20	0.01
n			
School	*47*		
Teacher	*77*		

Both Cohorts Combined, District B

Exhibit C-17. Impact of the NTC Model on Creating an Environment of Respect and Rapport – Both Cohorts Combined, District B

	Estimate	Standard Error	p-value
Treatment status	0.15	0.24	0.55
Baseline score	-0.10	0.12	0.40
Teacher variables			
Teacher is female CENTERED	-0.05	0.34	0.89
Teacher race is black CENTERED	-0.10	0.34	0.78
Teacher has only partial certification CENTERED	0.24	0.49	0.62
School variables			
School percent FRPL CENTERED	0.01	0.02	0.44
School report card rating - on one scale CENTERED	0.14	0.10	0.15
School percent non-white CENTERED	-0.03	0.04	0.43
School percent ELL CENTERED	<0.001	0.01	0.70
School percent Special Education CENTERED	-0.04	0.02	0.03
Blocking variables			
District B block 5	-0.65	0.34	0.05
District B block 7	-1.21	0.46	0.01
District B block 8	-0.34	0.33	0.31
District B block 6	-1.28	0.37	<0.001
Interactions with cohort			
Centered cohort indicator	-1.57	0.58	0.01
Cohort interaction: Baseline score	-0.02	0.24	0.92
Cohort interaction: Teacher is female	-0.20	0.68	0.76
Cohort interaction: Teacher race is black	-0.53	0.69	0.44
Cohort interaction: Teacher has only partial certification	0.36	0.96	0.71
Cohort interaction: School percent FRPL	-0.04	0.04	0.35
Cohort interaction: School report card rating – on one scale	-0.02	0.21	0.93
Cohort interaction: School percent non-white	0.07	0.07	0.33
Cohort interaction: School percent ELL	-0.02	0.02	0.29
Cohort interaction: School percent Special Education	-0.08	0.04	0.03
Cohort interaction: District B block 5	1.30	0.68	0.05
Cohort interaction: District B block 7	1.18	0.94	0.21
Cohort interaction: District B block 8	0.84	0.63	0.18
Cohort interaction: District B block 6	0.38	0.69	0.58
Constant	1.12	0.28	<0.001
Random effects			
School	<0.001		
Teacher	0.53		
n			
School	*61*		
Teacher	*82*		

Exhibit C-18. Impact of the NTC Model on Establishing a Culture for Learning – Both Cohorts Combined, District B

	Estimate	Standard Error	p-value
Treatment status	-0.34	0.24	0.16
Baseline score	-0.16	0.09	0.08
Teacher variables			
Teacher is female CENTERED	-0.24	0.32	0.45
Teacher race is black CENTERED	-0.16	0.31	0.60
Teacher has only partial certification CENTERED	-0.69	0.39	0.08
School variables			
School percent FRPL CENTERED	0.02	0.02	0.33
School report card rating - on one scale CENTERED	0.08	0.10	0.46
School percent non-white CENTERED	-0.04	0.03	0.25
School percent ELL CENTERED	<0.001	0.01	0.59
School percent Special Education CENTERED	-0.01	0.02	0.72
Blocking variables			
District B block 5	-0.82	0.38	0.03
District B block 7	-0.50	0.53	0.35
District B block 8	-0.11	0.40	0.78
District B block 6	-0.94	0.40	0.02
Interactions with cohort			
Centered cohort indicator	0.41	0.58	0.48
Cohort interaction: Baseline score	0.20	0.19	0.28
Cohort interaction: Teacher is female	-1.32	0.65	0.04
Cohort interaction: Teacher race is black	-1.12	0.62	0.07
Cohort interaction: Teacher has only partial certification	1.75	0.86	0.04
Cohort interaction: School percent FRPL	-0.02	0.04	0.53
Cohort interaction: School report card rating – on one scale	-0.11	0.21	0.59
Cohort interaction: School percent non-white	0.06	0.07	0.42
Cohort interaction: School percent ELL	0.01	0.02	0.51
Cohort interaction: School percent Special Education	0.04	0.03	0.31
Cohort interaction: District B block 5	0.08	0.74	0.91
Cohort interaction: District B block 7	-0.19	1.04	0.85
Cohort interaction: District B block 8	-1.46	0.70	0.04
Cohort interaction: District B block 6	0.17	0.72	0.81
Constant	1.31	0.31	<0.001
Random effects			
School	0.41		
Teacher	0.18		
n			
School	*61*		
Teacher	*82*		

Exhibit C-19. Impact of the NTC Model on Managing Classroom Procedures – Both Cohorts Combined, District B

	Estimate	Standard Error	p-value
Treatment status	0.56	0.25	0.03
Baseline score	0.05	0.12	0.69
Teacher variables			
Teacher is female CENTERED	0.56	0.42	0.18
Teacher race is black CENTERED	-0.28	0.40	0.48
Teacher has only partial certification CENTERED	0.18	0.34	0.59
School variables			
School percent FRPL CENTERED	0.03	0.03	0.26
School report card rating - on one scale CENTERED	0.04	0.08	0.60
School percent non-white CENTERED	-0.06	0.05	0.20
School percent ELL CENTERED	<0.001	0.01	0.55
School percent Special Education CENTERED	-0.03	0.02	0.06
Blocking variables			
District B block 5	-0.65	0.31	0.04
District B block 7	0.17	0.73	0.82
District B block 8	0.17	0.24	0.48
District B block 6	-0.28	0.35	0.43
Interactions with cohort			
Centered cohort indicator	-0.26	0.45	0.57
Cohort interaction: Baseline score	0.05	0.29	0.87
Cohort interaction: Teacher is female	0.50	0.92	0.58
Cohort interaction: Teacher race is black	0.67	0.83	0.42
Cohort interaction: Teacher has only partial certification	-1.05	0.61	0.09
Cohort interaction: School percent FRPL	-0.10	0.06	0.12
Cohort interaction: School report card rating – on one scale	0.28	0.19	0.13
Cohort interaction: School percent non-white	0.17	0.10	0.11
Cohort interaction: School percent ELL	0.01	0.01	0.31
Cohort interaction: School percent Special Education	-0.03	0.03	0.28
Cohort interaction: District B block 5	0.32	0.58	0.58
Cohort interaction: District B block 7	-2.49	1.52	0.10
Cohort interaction: District B block 8	-1.25	0.51	0.01
Cohort interaction: District B block 6	-1.91	0.74	0.01
Constant	0.77	0.23	<0.001
Random effects			
School	<0.001		
Teacher	0.51		
n			
School	*59*		
Teacher	*78*		

Exhibit C-20. Impact of the NTC Model on Managing Student Behavior – Both Cohorts Combined, District B

	Estimate	Standard Error	p-value
Treatment status	0.28	0.28	0.31
Baseline score	0.10	0.13	0.44
Teacher variables			
Teacher is female CENTERED	0.36	0.32	0.26
Teacher race is black CENTERED	-0.42	0.43	0.33
Teacher has only partial certification CENTERED	0.43	0.35	0.22
School variables			
School percent FRPL CENTERED	-0.01	0.02	0.81
School report card rating - on one scale CENTERED	0.10	0.09	0.30
School percent non-white CENTERED	<0.001	0.04	0.98
School percent ELL CENTERED	-0.01	0.01	0.37
School percent Special Education CENTERED	-0.01	0.02	0.49
Blocking variables			
District B block 5	-0.90	0.35	0.01
District B block 7	-1.30	0.42	<0.001
District B block 8	-0.09	0.24	0.70
District B block 6	-1.28	0.34	<0.001
Interactions with cohort			
Centered cohort indicator	-0.33	0.48	0.50
Cohort interaction: Baseline score	-0.26	0.26	0.32
Cohort interaction: Teacher is female	-0.23	0.65	0.72
Cohort interaction: Teacher race is black	0.16	0.84	0.85
Cohort interaction: Teacher has only partial certification	-0.59	0.63	0.35
Cohort interaction: School percent FRPL	-0.06	0.04	0.19
Cohort interaction: School report card rating – on one scale	0.01	0.20	0.95
Cohort interaction: School percent non-white	0.08	0.08	0.26
Cohort interaction: School percent ELL	<0.001	0.01	0.90
Cohort interaction: School percent Special Education	-0.02	0.03	0.52
Cohort interaction: District B block 5	1.12	0.71	0.11
Cohort interaction: District B block 7	0.42	0.87	0.63
Cohort interaction: District B block 8	-1.22	0.48	0.01
Cohort interaction: District B block 6	-1.60	0.63	0.01
Constant	0.91	0.22	<0.001
Random effects			
School	<0.001		
Teacher	0.63		
n			
School	*61*		
Teacher	*82*		

Exhibit C-21. Impact of the NTC Model on Communicating with Students – Both Cohorts Combined, District B

	Estimate	Standard Error	p-value
Treatment status	-0.29	0.27	0.29
Baseline score	<0.001	0.13	0.98
Teacher variables			
Teacher is female CENTERED	-0.17	0.38	0.65
Teacher race is black CENTERED	-0.44	0.40	0.27
Teacher has only partial certification CENTERED	0.25	0.57	0.66
School variables			
School percent FRPL CENTERED	-0.01	0.02	0.74
School report card rating - on one scale CENTERED	0.09	0.11	0.43
School percent non-white CENTERED	<0.001	0.04	0.96
School percent ELL CENTERED	<0.001	0.01	0.58
School percent Special Education CENTERED	-0.01	0.02	0.61
Blocking variables			
District B block 5	-0.74	0.40	0.06
District B block 7	-0.43	0.52	0.41
District B block 8	-0.20	0.41	0.62
District B block 6	-0.92	0.42	0.03
Interactions with cohort			
Centered cohort indicator	1.39	0.69	0.04
Cohort interaction: Baseline score	0.06	0.27	0.83
Cohort interaction: Teacher is female	-1.34	0.75	0.08
Cohort interaction: Teacher race is black	-0.49	0.82	0.55
Cohort interaction: Teacher has only partial certification	0.57	1.11	0.61
Cohort interaction: School percent FRPL	0.03	0.05	0.44
Cohort interaction: School report card rating – on one scale	0.10	0.24	0.67
Cohort interaction: School percent non-white	-0.05	0.09	0.57
Cohort interaction: School percent ELL	0.01	0.02	0.76
Cohort interaction: School percent Special Education	0.01	0.04	0.78
Cohort interaction: District B block 5	-1.08	0.79	0.17
Cohort interaction: District B block 7	0.07	1.05	0.95
Cohort interaction: District B block 8	-1.93	0.75	0.01
Cohort interaction: District B block 6	-0.84	0.77	0.28
Constant	1.14	0.32	<0.001
Random effects			
School	<0.001		
Teacher	0.68		
n			
School	*61*		
Teacher	*82*		

Exhibit C-22. Impact of the NTC Model on Using Questioning and Discussion Techniques – Both Cohorts Combined, District B

	Estimate	Standard Error	p-value
Treatment status	0.14	0.24	0.57
Baseline score	0.15	0.10	0.15
Teacher variables			
Teacher is female CENTERED	-0.08	0.34	0.81
Teacher race is black CENTERED	-0.05	0.47	0.92
Teacher has only partial certification CENTERED	-0.25	0.39	0.51
School variables			
School percent FRPL CENTERED	<0.001	0.02	0.99
School report card rating - on one scale CENTERED	0.07	0.10	0.46
School percent non-white CENTERED	-0.01	0.05	0.90
School percent ELL CENTERED	<0.001	0.01	0.95
School percent Special Education CENTERED	-0.03	0.02	0.11
Blocking variables			
District B block 5	-0.87	0.36	0.02
District B block 7	-1.11	0.42	0.01
District B block 8	-0.55	0.26	0.04
District B block 6	-1.44	0.32	<0.001
Interactions with cohort			
Centered cohort indicator	0.73	0.60	0.22
Cohort interaction: Baseline score	-0.42	0.21	0.04
Cohort interaction: Teacher is female	0.49	0.67	0.47
Cohort interaction: Teacher race is black	-0.58	0.91	0.52
Cohort interaction: Teacher has only partial certification	0.92	0.65	0.16
Cohort interaction: School percent FRPL	0.01	0.05	0.91
Cohort interaction: School report card rating – on one scale	-0.26	0.20	0.19
Cohort interaction: School percent non-white	-0.01	0.09	0.91
Cohort interaction: School percent ELL	-0.01	0.01	0.42
Cohort interaction: School percent Special Education	-0.07	0.03	0.03
Cohort interaction: District B block 5	0.56	0.71	0.43
Cohort interaction: District B block 7	0.36	1.02	0.72
Cohort interaction: District B block 8	-0.29	0.67	0.67
Cohort interaction: District B block 6	-0.85	0.61	0.16
Constant	1.42	0.25	<0.001
Random effects			
School	<0.001		
Teacher	0.55		
n			
School	*60*		
Teacher	*81*		

Exhibit C-23. Impact of the NTC Model on Engaging Students in Learning – Both Cohorts Combined, District B

	Estimate	Standard Error	p-value
Treatment status	-0.04	0.23	0.87
Baseline score	0.01	0.13	0.94
Teacher variables			
Teacher is female CENTERED	0.03	0.30	0.91
Teacher race is black CENTERED	-0.26	0.29	0.37
Teacher has only partial certification CENTERED	-0.38	0.35	0.28
School variables			
School percent FRPL CENTERED	-0.02	0.02	0.28
School report card rating - on one scale CENTERED	0.09	0.08	0.28
School percent non-white CENTERED	0.04	0.03	0.27
School percent ELL CENTERED	-0.01	0.01	0.28
School percent Special Education CENTERED	-0.03	0.02	0.05
Blocking variables			
District B block 5	-0.37	0.41	0.37
District B block 7	-1.23	0.41	<0.001
District B block 8	-0.19	0.28	0.51
District B block 6	-0.99	0.34	<0.001
Interactions with cohort			
Centered cohort indicator	0.93	0.60	0.12
Cohort interaction: Baseline score	-0.39	0.25	0.12
Cohort interaction: Teacher is female	0.37	0.61	0.54
Cohort interaction: Teacher race is black	-1.15	0.56	0.04
Cohort interaction: Teacher has only partial certification	0.43	0.61	0.48
Cohort interaction: School percent FRPL	0.01	0.03	0.78
Cohort interaction: School report card rating – on one scale	-0.12	0.16	0.47
Cohort interaction: School percent non-white	-0.02	0.07	0.75
Cohort interaction: School percent ELL	<0.001	0.01	0.88
Cohort interaction: School percent Special Education	<0.001	0.03	0.92
Cohort interaction: District B block 5	0.30	0.83	0.72
Cohort interaction: District B block 7	0.58	0.81	0.47
Cohort interaction: District B block 8	-1.50	0.68	0.03
Cohort interaction: District B block 6	-1.14	0.61	0.06
Constant	1.05	0.29	<0.001
Random effects			
School	<0.001		
Teacher	0.45		
n			
School	*61*		
Teacher	*81*		

Exhibit C-24. Impact of the NTC Model on Using Assessment in Instruction – Both Cohorts Combined, District B

	Estimate	Standard Error	p-value
Treatment status	-0.21	0.26	0.42
Baseline score	-0.04	0.11	0.69
Teacher variables			
Teacher is female CENTERED	0.25	0.28	0.37
Teacher race is black CENTERED	0.17	0.46	0.71
Teacher has only partial certification CENTERED	0.12	0.35	0.72
School variables			
School percent FRPL CENTERED	<0.001	0.03	0.95
School report card rating - on one scale CENTERED	-0.07	0.09	0.43
School percent non-white CENTERED	-0.02	0.05	0.64
School percent ELL CENTERED	-0.01	0.01	0.35
School percent Special Education CENTERED	-0.04	0.02	0.07
Blocking variables			
District B block 5	-0.82	0.35	0.02
District B block 7	-1.14	0.56	0.04
District B block 8	0.14	0.24	0.57
District B block 6	-1.60	0.42	<0.001
Interactions with cohort			
Centered cohort indicator	-0.02	0.53	0.97
Cohort interaction: Baseline score	-0.13	0.21	0.55
Cohort interaction: Teacher is female	0.34	0.62	0.58
Cohort interaction: Teacher race is black	-2.24	0.87	0.01
Cohort interaction: Teacher has only partial certification	-0.92	0.56	0.10
Cohort interaction: School percent FRPL	-0.02	0.05	0.65
Cohort interaction: School report card rating – on one scale	0.02	0.21	0.91
Cohort interaction: School percent non-white	0.10	0.11	0.34
Cohort interaction: School percent ELL	<0.001	0.01	0.85
Cohort interaction: School percent Special Education	0.04	0.04	0.30
Cohort interaction: District B block 5	0.78	0.66	0.24
Cohort interaction: District B block 7	-1.15	1.32	0.38
Cohort interaction: District B block 8	-1.51	0.56	0.01
Cohort interaction: District B block 6	-2.40	0.67	<0.001
Constant	1.65	0.24	<0.001
Random effects			
School	<0.001		
Teacher	0.60		
n			
School	*60*		
Teacher	*81*		

Cohort 1, Both Districts Combined

Exhibit C-25. Impact of the NTC Model on Creating an Environment of Respect and Rapport – Cohort 1, Both Districts Combined

	Estimate	Standard Error	p-value
Treatment status	0.16	0.21	0.44
Baseline score	0.05	0.14	0.73
Teacher variables			
Teacher is female CENTERED	0.43	0.27	0.10
Teacher race is black CENTERED	0.16	0.27	0.54
Teacher has only partial certification CENTERED	-0.12	0.19	0.53
School variables			
School percent FRPL CENTERED	0.02	0.02	0.29
School report card rating - on one scale CENTERED	0.02	0.19	0.92
School percent non-white CENTERED	-0.04	0.04	0.27
School percent ELL CENTERED	0.01	0.01	0.50
School percent Special Education CENTERED	0.02	0.04	0.53
Blocking Variables			
District A block 3	1.10	0.61	0.07
District A block 2	-0.41	0.55	0.46
District B block 5	-1.23	0.45	0.01
District B block 7	-1.74	0.58	<0.001
District B block 8	-0.87	0.33	0.01
District B block 6	-1.26	0.30	<0.001
Interactions with district			
Centered district indicator	-1.92	0.46	<0.001
District interaction: Baseline score	0.59	0.30	0.05
District interaction: Teacher is female	-0.13	0.55	0.82
District interaction: Teacher race is black	-0.04	0.53	0.94
District interaction: Teacher has only partial certification	-0.40	0.39	0.30
District interaction: School percent FRPL	-0.07	0.04	0.08
District interaction: School report card rating – on one scale	-0.28	0.35	0.43
District interaction: School percent non-white	0.12	0.07	0.07
District interaction: School percent ELL	-0.01	0.02	0.61
District interaction: School percent Special Education	0.08	0.07	0.29
Constant	0.97	0.20	<0.001
Random effects			
School	<0.001		
Teacher	0.43		
n			
School	*56*		
Teacher	*71*		

Exhibit C-26. Impact of the NTC Model on Establishing a Culture for Learning – Cohort 1, Both Districts Combined

	Estimate	Standard Error	p-value
Treatment status	-0.10	0.23	0.67
Baseline score	0.07	0.10	0.53
Teacher variables			
Teacher is female CENTERED	-0.17	0.34	0.61
Teacher race is black CENTERED	0.08	0.30	0.79
Teacher has only partial certification CENTERED	-0.31	0.42	0.46
School variables			
School percent FRPL CENTERED	0.02	0.02	0.45
School report card rating - on one scale CENTERED	0.31	0.15	0.04
School percent non-white CENTERED	-0.01	0.04	0.79
School percent ELL CENTERED	-0.02	0.01	0.08
School percent Special Education CENTERED	-0.03	0.04	0.41
Blocking variables			
District A block 3	-1.87	0.53	<0.001
District A block 2	-1.44	0.51	0.01
District B block 5	-0.98	0.51	0.05
District B block 7	-0.59	0.78	0.45
District B block 8	0.52	0.44	0.23
District B block 6	-1.03	0.37	0.01
Centered district indicator	-0.42	0.55	0.44
Interactions with district			
District interaction: Baseline score	0.41	0.21	0.05
District interaction: Teacher is female	-0.79	0.68	0.25
District interaction: Teacher race is black	-0.02	0.65	0.97
District interaction: Teacher has only partial certification	0.65	0.81	0.42
District interaction: School percent FRPL	-0.04	0.04	0.30
District interaction: School report card rating – on one scale	0.34	0.29	0.24
District interaction: School percent non-white	0.10	0.08	0.19
District interaction: School percent ELL	<0.001	0.02	0.87
District interaction: School percent Special Education	-0.01	0.07	0.89
Constant	0.83	0.25	<0.001
Random effects			
School	<0.001		
Teacher	0.47		
n			
School	*56*		
Teacher	*71*		

Exhibit C-27. Impact of the NTC Model on Managing Classroom Procedures – Cohort 1, Both Districts Combined

	Estimate	Standard Error	p-value
Treatment status	0.23	0.25	0.37
Baseline score	-0.05	0.16	0.76
Teacher controls			
Teacher is female CENTERED	-0.44	0.42	0.29
Teacher race is black CENTERED	0.14	0.32	0.66
Teacher has only partial certification CENTERED	0.18	0.43	0.68
School controls			
School percent FRPL CENTERED	<0.001	0.02	0.86
School report card rating - on one scale CENTERED	0.14	0.16	0.39
School percent non-white CENTERED	<0.001	0.04	0.93
School percent ELL CENTERED	-0.01	0.01	0.40
School percent Special Education CENTERED	-0.04	0.05	0.34
Blocking Variables			
District A block 3	-0.47	0.62	0.45
District A block 2	-0.51	0.62	0.41
District B block 5	-0.37	0.51	0.47
District B block 7	0.58	1.04	0.58
District B block 8	0.80	0.43	0.06
District B block 6	0.67	0.37	0.07
Interactions with district			
Centered district indicator	-0.36	0.60	0.55
District interaction: Baseline score	-0.19	0.32	0.55
District interaction: Teacher is female	-0.62	0.80	0.44
District interaction: Teacher race is black	0.56	0.72	0.43
District interaction: Teacher has only partial certification	-1.19	0.83	0.15
District interaction: School percent FRPL	-0.07	0.05	0.14
District interaction: School report card rating – on one scale	0.41	0.32	0.21
District interaction: School percent non-white	0.14	0.08	0.07
District interaction: School percent ELL	<0.001	0.02	0.99
District interaction: School percent Special Education	-0.07	0.09	0.44
Constant	0.66	0.27	0.02
Random effects			
School	<0.001		
Teacher	0.44		
n			
School	*51*		
Teacher	*59*		

Exhibit C-28. Impact of the NTC Model on Managing Student Behavior – Cohort 1, Both Districts Combined

	Estimate	Standard Error	p-value
Treatment status	0.34	0.24	0.15
Baseline score	0.23	0.13	0.08
Teacher controls			
Teacher is female CENTERED	0.45	0.34	0.18
Teacher race is black CENTERED	0.10	0.31	0.75
Teacher has only partial certification CENTERED	-0.07	0.44	0.87
School controls			
School percent FRPL CENTERED	<0.001	0.02	0.93
School report card rating - on one scale CENTERED	0.28	0.16	0.08
School percent non-white CENTERED	<0.001	0.04	0.92
School percent ELL CENTERED	<0.001	0.01	0.76
School percent Special Education CENTERED	0.05	0.04	0.25
Blocking variables			
District A block 3	0.60	0.59	0.30
District A block 2	1.21	0.54	0.03
District B block 5	-1.31	0.54	0.01
District B block 7	-1.63	0.76	0.03
District B block 8	0.54	0.49	0.27
District B block 6	-0.49	0.40	0.22
Interactions with district			
Centered district indicator	-1.55	0.59	0.01
District interaction: Baseline score	-0.11	0.27	0.69
District interaction: Teacher is female	-0.03	0.67	0.96
District interaction: Teacher race is black	1.19	0.68	0.08
District interaction: Teacher has only partial certification	-0.97	0.86	0.26
District interaction: School percent FRPL	-0.04	0.04	0.38
District interaction: School report card rating – on one scale	0.41	0.30	0.18
District interaction: School percent non-white	0.10	0.07	0.16
District interaction: School percent ELL	0.02	0.03	0.35
District interaction: School percent Special Education	0.08	0.08	0.31
Constant	0.27	0.27	0.32
Random effects			
School	0.03		
Teacher	0.50		
n			
School	*56*		
Teachers	*71*		

Exhibit C-29. Impact of the NTC Model on Communicating with Students – Cohort 1, Both Districts Combined

	Estimate	Standard Error	p-value
Treatment status	-0.06	0.24	0.80
Baseline score	<0.001	0.12	0.97
Teacher controls			
Teacher is female CENTERED	0.13	0.33	0.69
Teacher race is black CENTERED	-0.41	0.32	0.20
Teacher has only partial certification CENTERED	-0.13	0.44	0.76
School controls			
School percent FRPL CENTERED	-0.02	0.02	0.32
School report card rating - on one scale CENTERED	0.10	0.16	0.54
School percent non-white CENTERED	0.03	0.04	0.51
School percent ELL CENTERED	-0.01	0.01	0.47
School percent Special Education CENTERED	0.02	0.04	0.57
Blocking variables			
District A block 3	-0.65	0.61	0.28
District A block 2	-1.00	0.55	0.07
District B block 5	-0.55	0.56	0.33
District B block 7	-0.57	0.73	0.44
District B block 8	0.48	0.53	0.36
District B block 6	-0.72	0.42	0.09
Interactions with district			
Centered district indicator	-0.36	0.61	0.55
District interaction: Baseline score	0.20	0.23	0.39
District interaction: Teacher is female	-0.94	0.65	0.15
District interaction: Teacher race is black	0.03	0.70	0.96
District interaction: Teacher has only partial certification	0.22	0.86	0.80
District interaction: School percent FRPL	-0.01	0.04	0.84
District interaction: School report card rating – on one scale	0.23	0.31	0.45
District interaction: School percent non-white	0.06	0.08	0.40
District interaction: School percent ELL	-0.03	0.02	0.29
District interaction: School percent Special Education	0.08	0.08	0.35
Constant	0.46	0.28	0.10
Random effects			
School	0.09		
Teacher	0.43		
n			
School	*56*		
Teacher	*70*		

Exhibit C-30. Impact of the NTC Model on Using Questioning and Discussion Techniques – Cohort 1, Both Districts Combined

	Estimate	Standard Error	p-value
Treatment status	-0.04	0.23	0.86
Baseline score	0.10	0.13	0.42
Teacher controls			
Teacher is female CENTERED	-0.27	0.32	0.40
Teacher race is black CENTERED	0.30	0.31	0.32
Teacher has only partial certification CENTERED	-0.59	0.42	0.16
School controls			
School percent FRPL CENTERED	-0.02	0.02	0.21
School report card rating - on one scale CENTERED	0.24	0.16	0.13
School percent non-white CENTERED	0.04	0.04	0.22
School percent ELL CENTERED	0.01	0.01	0.54
School percent Special Education CENTERED	0.07	0.04	0.06
Blocking variables			
District A block 3	-1.33	0.69	0.05
District A block 2	<0.001	0.55	0.99
District B block 5	-0.74	0.52	0.15
District B block 7	-1.05	0.77	0.17
District B block 8	-0.16	0.45	0.72
District B block 6	-0.87	0.38	0.02
Interactions with district			
Centered district indicator	-0.29	0.58	0.62
District interaction: Baseline score	-0.52	0.26	0.04
District interaction: Teacher is female	0.34	0.64	0.59
District interaction: Teacher race is black	-0.56	0.67	0.40
District interaction: Teacher has only partial certification	0.16	0.82	0.85
District interaction: School percent FRPL	-0.02	0.04	0.55
District interaction: School report card rating – on one scale	0.12	0.30	0.69
District interaction: School percent non-white	0.06	0.07	0.39
District interaction: School percent ELL	<0.001	0.02	0.93
District interaction: School percent Special Education	0.15	0.08	0.06
Constant	0.78	0.27	<0.001
Random effects			
School	<0.001		
Teacher	0.49		
n			
School	*55*		
Teacher	*69*		

Exhibit C-31. Impact of the NTC Model on Engaging Students in Learning – Cohort 1, Both Districts Combined

	Estimate	Standard Error	p-value
Treatment status	-0.11	0.24	0.65
Baseline score	0.16	0.13	0.22
Teacher controls			
Teacher is female CENTERED	-0.37	0.35	0.29
Teacher race is black CENTERED	0.31	0.33	0.34
Teacher has only partial certification CENTERED	-0.74	0.46	0.11
School controls			
School percent FRPL CENTERED	-0.02	0.02	0.29
School report card rating - on one scale CENTERED	0.26	0.16	0.11
School percent non-white CENTERED	0.05	0.04	0.24
School percent ELL CENTERED	<0.001	0.01	0.74
School percent Special Education CENTERED	0.03	0.04	0.44
Blocking variables			
District A block 3	-1.02	0.65	0.12
District A block 2	-0.31	0.56	0.58
District B block 5	-0.16	0.62	0.80
District B block 7	-1.15	0.76	0.13
District B block 8	0.75	0.55	0.17
District B block 6	-0.19	0.43	0.66
Interactions with district			
Centered district indicator	0.24	0.66	0.71
District interaction: Baseline score	-0.19	0.26	0.48
District interaction: Teacher is female	-0.44	0.70	0.53
District interaction: Teacher race is black	0.05	0.70	0.95
District interaction: Teacher has only partial certification	-0.03	0.90	0.98
District interaction: School percent FRPL	-0.01	0.04	0.80
District interaction: School report card rating – on one scale	0.30	0.31	0.34
District interaction: School percent non-white	0.02	0.08	0.76
District interaction: School percent ELL	0.03	0.03	0.29
District interaction: School percent Special Education	0.13	0.08	0.11
Constant	0.53	0.31	0.08
Random effects			
School	<0.001		
Teacher	0.55		
n			
School	*56*		
Teacher	*70*		

Exhibit C-32. Impact of the NTC Model on Using Assessment in Instruction – Cohort 1, Both Districts Combined

	Estimate	Standard Error	p-value
Treatment status	-0.21	0.22	0.34
Baseline score	-0.03	0.11	0.82
Teacher controls			
Teacher is female CENTERED	-0.09	0.35	0.79
Teacher race is black CENTERED	0.72	0.31	0.02
Teacher has only partial certification CENTERED	0.13	0.39	0.73
School controls			
School percent FRPL CENTERED	<0.001	0.02	0.84
School report card rating - on one scale CENTERED	-0.01	0.15	0.96
School percent non-white CENTERED	-0.01	0.04	0.79
School percent ELL CENTERED	<0.001	0.01	0.64
School percent Special Education CENTERED	-0.03	0.04	0.45
Blocking variables			
District A block 3	-1.36	0.53	0.01
District A block 2	-1.01	0.50	0.04
District B block 5	-0.90	0.54	0.10
District B block 7	-0.24	0.99	0.81
District B block 8	0.76	0.49	0.12
District B block 6	-0.27	0.37	0.46
Interactions with district			
Centered district indicator	-0.62	0.60	0.30
District interaction: Baseline score	-0.20	0.23	0.38
District interaction: Teacher is female	-0.38	0.68	0.58
District interaction: Teacher race is black	-1.76	0.67	0.01
District interaction: Teacher has only partial certification	-0.74	0.77	0.33
District interaction: School percent FRPL	-0.02	0.05	0.66
District interaction: School report card rating – on one scale	0.13	0.28	0.64
District interaction: School percent non-white	0.08	0.08	0.33
District interaction: School percent ELL	<0.001	0.02	0.95
District interaction: School percent Special Education	0.06	0.07	0.36
Constant	1.06	0.27	<0.001
Random effects			
School	<0.001		
Teacher	0.42		
n			
School	*55*		
Teacher	*70*		

Cohort 1, District A

Exhibit C-33. Impact of the NTC Model on Creating an Environment of Respect and Rapport – Cohort 1, District A

	Estimate	Standard Error	p-value
Treatment status	0.29	0.37	0.44
Baseline score	1.01	0.13	<0.001
Teacher variables			
Teacher is female CENTERED	0.79	0.24	<0.001
Teacher race is black CENTERED	0.08	0.17	0.64
Teacher has only partial certification CENTERED	-0.20	0.20	0.31
School variables			
School percent FRPL CENTERED	-0.01	0.02	0.43
School report card rating – on one scale CENTERED	-0.35	0.27	0.19
School percent non-white CENTERED	0.01	0.02	0.78
School percent ELL CENTERED	0.02	0.02	0.48
School percent Special Education CENTERED	0.19	0.08	0.02
Blocking variables			
District A block 3	2.04	0.59	<0.001
District A block 2	0.02	0.60	0.97
Constant	-0.30	0.35	0.39
Random effects			
School	0.58		
Teacher	0.08		
n			
School	*24*		
Teacher	*33*		

Exhibit C-34. Impact of the NTC Model on Establishing a Culture for Learning – Cohort 1, District A

	Estimate	Standard Error	p-value
Treatment status	0.73	0.28	0.01
Baseline score	0.06	0.13	0.68
Teacher variables			
Teacher is female CENTERED	-0.60	0.24	0.01
Teacher race is black CENTERED	0.28	0.28	0.33
Teacher has only partial certification CENTERED	-0.56	0.28	0.05
School variables			
School percent FRPL CENTERED	-0.03	0.01	0.05
School report card rating – on one scale CENTERED	0.25	0.31	0.42
School percent non-white CENTERED	0.04	0.02	0.05
School percent ELL CENTERED	-0.01	0.02	0.73
School percent Special Education CENTERED	-0.05	0.06	0.38
Blocking variables			
District A block 3	-1.24	0.55	0.02
District A block 2	-1.23	0.38	<0.001
Constant	0.05	0.26	0.84
Random effects			
School	<0.001		
Teacher	0.36		
n			
School	*24*		
Teacher	*33*		

Exhibit C-35. Impact of the NTC Model on Managing Classroom Procedures – Cohort 1, District A

	Estimate	Standard Error	p-value
Treatment status	-0.04	0.33	0.89
Baseline score	-0.12	0.24	0.62
Teacher variables			
Teacher is female CENTERED	-0.83	0.35	0.02
Teacher race is black CENTERED	0.28	0.36	0.44
Teacher has only partial certification CENTERED	-0.30	0.34	0.38
School variables			
School percent FRPL CENTERED	-0.03	0.01	0.06
School report card rating – on one scale CENTERED	0.36	0.25	0.15
School percent non-white CENTERED	0.07	0.02	<0.001
School percent ELL CENTERED	-0.01	0.02	0.63
School percent Special Education CENTERED	-0.07	0.07	0.37
Blocking variables			
District A block 3	-0.51	0.53	0.33
District A block 2	-0.59	0.53	0.26
Constant	0.69	0.34	0.04
Random effects			
School	<0.001		
Teacher	0.31		
n			
School	*21*		
Teacher	*24*		

Exhibit C-36. Impact of the NTC Model on Managing Student Behavior – Cohort 1, District A

	Estimate	Standard Error	p-value
Treatment status	1.08	0.25	<0.001
Baseline score	0.32	0.15	0.04
Teacher variables			
Teacher is female CENTERED	0.64	0.26	0.01
Teacher race is black CENTERED	0.89	0.23	<0.001
Teacher has only partial certification CENTERED	-0.68	0.24	<0.001
School variables			
School percent FRPL CENTERED	-0.02	0.01	0.15
School report card rating – on one scale CENTERED	0.34	0.21	0.10
School percent non-white CENTERED	0.04	0.02	0.01
School percent ELL CENTERED	0.01	0.02	0.57
School percent Special Education CENTERED	0.07	0.06	0.20
Blocking variables			
District A block 3	1.07	0.45	0.02
District A block 2	1.28	0.40	<0.001
Constant	-1.02	0.25	<0.001
Random effects			
School	0.06		
Teacher	0.22		
n			
School	*24*		
Teacher	*33*		

Exhibit C-37. Impact of the NTC Model on Communicating with Students – Cohort 1, District A

	Estimate	Standard Error	p-value
Treatment status	0.40	0.36	0.26
Baseline score	0.28	0.05	<0.001
Teacher variables			
Teacher is female CENTERED	0.38	0.11	<0.001
Teacher race is black CENTERED	-0.83	0.09	<0.001
Teacher has only partial certification CENTERED	-0.62	0.11	<0.001
School variables			
School percent FRPL CENTERED	-0.02	0.01	0.16
School report card rating – on one scale CENTERED	<0.001	0.19	0.99
School percent non-white CENTERED	0.05	0.02	0.01
School percent ELL CENTERED	-0.03	0.02	0.19
School percent Special Education CENTERED	0.12	0.07	0.09
Blocking variables			
District A block 3	0.20	0.51	0.69
District A block 2	-0.57	0.54	0.29
Constant	0.16	0.32	0.62
Random effects			
School	0.60		
Teacher	0.02		
n			
School	*24*		
Teacher	*32*		

Exhibit C-38. Impact of the NTC Model on Using Questioning and Discussion Techniques – Cohort 1, District A

	Estimate	Standard Error	p-value
Treatment status	0.13	0.25	0.60
Baseline score	-0.14	0.16	0.37
Teacher variables			
Teacher is female CENTERED	-0.07	0.25	0.78
Teacher race is black CENTERED	0.08	0.25	0.77
Teacher has only partial certification CENTERED	-0.56	0.23	0.02
School variables			
School percent FRPL CENTERED	-0.04	0.01	<0.001
School report card rating – on one scale CENTERED	0.27	0.21	0.21
School percent non-white CENTERED	0.07	0.02	<0.001
School percent ELL CENTERED	0.01	0.02	0.68
School percent Special Education CENTERED	0.14	0.06	0.01
Blocking variables			
District A block 3	-1.22	0.53	0.02
District A block 2	0.03	0.42	0.94
Constant	0.51	0.26	0.05
Random effects			
School	<0.001		
Teacher	0.28		
n			
School	*24*		
Teacher	*32*		

Exhibit C-39. Impact of the NTC Model on Engaging Students in Learning – Cohort 1, District A

	Estimate	Standard Error	p-value
Treatment status	0.15	0.33	0.64
Baseline score	0.08	0.19	0.69
Teacher variables			
Teacher is female CENTERED	-0.54	0.35	0.12
Teacher race is black CENTERED	0.42	0.33	0.21
Teacher has only partial certification CENTERED	-0.83	0.31	0.01
School variables			
School percent FRPL CENTERED	-0.03	0.02	0.10
School report card rating – on one scale CENTERED	0.36	0.28	0.20
School percent non-white CENTERED	0.05	0.02	0.01
School percent ELL CENTERED	0.02	0.02	0.40
School percent Special Education CENTERED	0.09	0.07	0.22
Blocking variables			
District A block 3	-0.89	0.63	0.16
District A block 2	-0.27	0.54	0.61
Constant	0.46	0.32	0.15
Random effects			
School	<0.001		
Teacher	0.50		
n			
School	*24*		
Teacher	*33*		

Exhibit C-40. Impact of the NTC Model on Using Assessment in Instruction – Cohort 1, District A

	Estimate	Standard Error	p-value
Treatment status	0.01	0.30	0.97
Baseline score	-0.02	0.14	0.89
Teacher variables			
Teacher is female CENTERED	-0.51	0.23	0.03
Teacher race is black CENTERED	-0.36	0.19	0.06
Teacher has only partial certification CENTERED	-0.12	0.21	0.56
School variables			
School percent FRPL CENTERED	-0.02	0.02	0.30
School report card rating – on one scale CENTERED	-0.14	0.23	0.54
School percent non-white CENTERED	0.02	0.02	0.24
School percent ELL CENTERED	-0.01	0.02	0.54
School percent Special Education CENTERED	-0.03	0.07	0.67
Blocking variables			
District A block 3	-1.34	0.50	0.01
District A block 2	-1.49	0.48	<0.001
Constant	0.75	0.30	0.01
Random effects			
School	0.30		
Teacher	0.12		
n			
School	*24*		
Teacher	*33*		

Cohort 1, District B

Exhibit C-41. Impact of the NTC Model on Creating an Environment of Respect and Rapport – Cohort 1, District B

	Estimate	Standard Error	p-value
Treatment status	0.10	0.30	0.75
Baseline score	-0.22	0.21	0.30
Teacher variables			
Teacher is female CENTERED	0.52	0.48	0.28
Teacher race is black CENTERED	0.26	0.52	0.62
Teacher has only partial certification CENTERED	0.11	0.25	0.65
School variables			
School percent FRPL CENTERED	0.05	0.03	0.13
School report card rating – on one scale CENTERED	0.16	0.13	0.20
School percent non-white CENTERED	-0.10	0.07	0.17
School percent ELL CENTERED	0.01	0.01	0.21
School percent Special Education CENTERED	-0.02	0.03	0.49
Blocking variables			
District B block 5	-1.14	0.51	0.03
District B block 7	-1.75	0.58	<0.001
District B block 8	-0.80	0.35	0.02
District B block 6	-1.21	0.33	<0.001
Constant	1.91	0.36	<0.001
Random effects			
School	<0.001		
Teacher	0.38		
n			
School	*33*		
Teacher	*38*		

Exhibit C-42. Impact of the NTC Model on Establishing a Culture for Learning – Cohort 1, District B

	Estimate	Standard Error	p-value
Treatment status	-0.68	0.31	0.03
Baseline score	-0.33	0.09	<0.001
Teacher variables			
Teacher is female CENTERED	0.68	0.54	0.21
Teacher race is black CENTERED	0.62	0.33	0.06
Teacher has only partial certification CENTERED	-0.59	0.82	0.47
School variables			
School percent FRPL CENTERED	0.03	0.03	0.35
School report card rating – on one scale CENTERED	0.16	0.13	0.23
School percent non-white CENTERED	-0.04	0.06	0.54
School percent ELL CENTERED	-0.01	0.01	0.35
School percent Special Education CENTERED	-0.03	0.03	0.24
Blocking variables			
District B block 5	-0.49	0.62	0.43
District B block 7	-0.26	0.82	0.75
District B block 8	0.59	0.61	0.33
District B block 6	-0.91	0.51	0.08
Constant	1.07	0.55	0.05
Random effects			
School	0.50		
Teacher	0.05		
n			
School	*32*		
Teacher	*38*		

Exhibit C-43. Impact of the NTC Model on Managing Classroom Procedures – Cohort 1, District B

	Estimate	Standard Error	p-value
Treatment status	0.43	0.36	0.24
Baseline score	0.03	0.18	0.86
Teacher variables			
Teacher is female CENTERED	0.02	0.79	0.98
Teacher race is black CENTERED	-0.30	0.62	0.63
Teacher has only partial certification CENTERED	0.70	0.81	0.39
School variables			
School percent FRPL CENTERED	0.05	0.05	0.27
School report card rating – on one scale CENTERED	-0.11	0.16	0.50
School percent non-white CENTERED	-0.10	0.09	0.27
School percent ELL CENTERED	-0.01	0.01	0.36
School percent Special Education CENTERED	-0.01	0.03	0.71
Blocking variables			
District B block 5	-0.57	0.60	0.34
District B block 7	0.80	1.16	0.49
District B block 8	0.72	0.47	0.13
District B block 6	0.61	0.41	0.14
Constant	0.89	0.51	0.08
Random effects			
School	<0.001		
Teacher	0.51		
n			
School	*30*		
Teacher	*35*		

Exhibit C-44. Impact of the NTC Model on Managing Student Behavior – Cohort 1, District B

	Estimate	Standard Error	p-value
Treatment status	-0.32	0.35	0.37
Baseline score	0.32	0.18	0.08
Teacher variables			
Teacher is female CENTERED	0.31	0.62	0.62
Teacher race is black CENTERED	0.13	0.66	0.84
Teacher has only partial certification CENTERED	0.75	0.88	0.40
School variables			
School percent FRPL CENTERED	-0.01	0.04	0.77
School report card rating – on one scale CENTERED	0.18	0.15	0.22
School percent non-white CENTERED	0.03	0.08	0.70
School percent ELL CENTERED	-0.01	0.01	0.65
School percent Special Education CENTERED	<0.001	0.03	0.88
Blocking variables			
District B block 5	-0.68	0.62	0.27
District B block 7	-1.73	0.82	0.04
District B block 8	0.78	0.54	0.15
District B block 6	-0.25	0.45	0.58
Constant	0.86	0.53	0.11
Random effects			
School	0.03		
Teacher	0.58		
n			
School	*32*		
Teacher	*38*		

Exhibit C-45. Impact of the NTC Model on Communicating with Students – Cohort 1, District B

	Estimate	Standard Error	p-value
Treatment status	-0.48	0.34	0.16
Baseline score	<0.001	0.19	0.99
Teacher variables			
Teacher is female CENTERED	0.43	0.57	0.46
Teacher race is black CENTERED	0.02	0.66	0.98
Teacher has only partial certification CENTERED	0.10	0.85	0.91
School variables			
School percent FRPL CENTERED	-0.04	0.04	0.38
School report card rating – on one scale CENTERED	0.07	0.15	0.61
School percent non-white CENTERED	0.05	0.08	0.55
School percent ELL CENTERED	<0.001	0.01	0.80
School percent Special Education CENTERED	-0.02	0.02	0.48
Blocking variables			
District B block 5	<0.001	0.61	0.99
District B block 7	-0.49	0.73	0.50
District B block 8	0.86	0.53	0.10
District B block 6	-0.43	0.41	0.29
Constant	0.37	0.52	0.48
Random effects			
School	<0.001		
Teacher	0.54		
n			
School	*32*		
Teacher	*38*		

Exhibit C-46. Impact of the NTC Model on Using Questioning and Discussion Techniques – Cohort 1, District B

	Estimate	Standard Error	p-value
Treatment status	-0.19	0.36	0.60
Baseline score	0.37	0.18	0.04
Teacher variables			
Teacher is female CENTERED	-0.48	0.64	0.45
Teacher race is black CENTERED	0.74	0.69	0.29
Teacher has only partial certification CENTERED	-0.58	0.91	0.53
School variables			
School percent FRPL CENTERED	-0.02	0.04	0.65
School report card rating – on one scale CENTERED	0.20	0.17	0.23
School percent non-white CENTERED	0.03	0.09	0.71
School percent ELL CENTERED	0.01	0.01	0.45
School percent Special Education CENTERED	<0.001	0.03	0.92
Blocking variables			
District B block 5	-0.60	0.65	0.36
District B block 7	-1.08	0.90	0.23
District B block 8	-0.11	0.53	0.84
District B block 6	-0.81	0.45	0.07
Constant	0.88	0.56	0.12
Random effects			
School	<0.001		
Teacher	0.66		
n			
School	*31*		
Teacher	*37*		

Exhibit C-47. Impact of the NTC Model on Engaging Students in Learning – Cohort 1, District B

	Estimate	Standard Error	p-value
Treatment status	-0.35	0.34	0.30
Baseline score	0.27	0.18	0.13
Teacher variables			
Teacher is female CENTERED	-0.22	0.62	0.72
Teacher race is black CENTERED	0.53	0.64	0.41
Teacher has only partial certification CENTERED	-0.61	0.88	0.49
School variables			
School percent FRPL CENTERED	-0.03	0.04	0.48
School report card rating – on one scale CENTERED	0.15	0.15	0.31
School percent non-white CENTERED	0.07	0.08	0.42
School percent ELL CENTERED	-0.01	0.01	0.50
School percent Special Education CENTERED	-0.03	0.03	0.18
Blocking variables			
District B block 5	0.10	0.68	0.88
District B block 7	-1.19	0.78	0.13
District B block 8	0.84	0.57	0.14
District B block 6	-0.09	0.45	0.83
Constant	0.32	0.58	0.58
Random effects			
School	<0.001		
Teacher	0.58		
n			
School	*32*		
Techer	*37*		

Exhibit C-48. Impact of the NTC Model on Using Assessment in Instruction – Cohort 1, District B

	Estimate	Standard Error	p-value
Treatment status	-0.30	0.30	0.31
Baseline score	0.02	0.12	0.87
Teacher variables			
Teacher is female CENTERED	0.03	0.50	0.96
Teacher race is black CENTERED	1.31	0.78	0.09
Teacher has only partial certification CENTERED	0.61	0.32	0.05
School variables			
School percent FRPL CENTERED	0.01	0.06	0.93
School report card rating – on one scale CENTERED	-0.06	0.17	0.73
School percent non-white CENTERED	-0.07	0.12	0.59
School percent ELL CENTERED	-0.01	0.01	0.34
School percent Special Education CENTERED	-0.06	0.03	0.03
Blocking variables			
District B block 5	-1.19	0.64	0.06
District B block 7	-0.70	1.11	0.53
District B block 8	0.98	0.26	<0.001
District B block 6	-0.40	0.23	0.08
Constant	1.71	0.49	<0.001
Random effects			
School	<0.001		
Teacher	0.43		
n			
School	*31*		
Teacher	*37*		

Cohort 2, Both Districts Combined

Exhibit C-49. Impact of the NTC Model on Creating an Environment of Respect and Rapport – Cohort 2, Both Districts Combined

	Estimate	Standard Error	p-value
Treatment status	-0.10	0.25	0.70
Baseline score	-0.05	0.12	0.68
Teacher variables			
Teacher is female CENTERED	-0.27	0.32	0.40
Teacher race is black CENTERED	-0.37	0.29	0.20
Teacher has only partial certification CENTERED	0.14	0.32	0.65
School variables			
School percent FRPL CENTERED	-0.02	0.01	0.05
School report card rating – on one scale CENTERED	-0.08	0.14	0.57
School percent non-white CENTERED	0.02	0.01	0.19
School percent ELL CENTERED	0.01	0.01	0.41
School percent Special Education CENTERED	-0.08	0.03	0.01
Blocking variables			
District A block 3	-0.05	0.34	0.89
District A block 2	0.03	0.49	0.95
District B block 5	-0.01	0.31	0.97
District B block 7	-0.26	0.59	0.65
District B block 8	0.24	0.40	0.54
District B block 6	-0.96	0.79	0.22
Interactions with district			
Centered district indicator	-0.28	0.33	0.40
District interaction: Baseline score	0.24	0.22	0.27
District interaction: Teacher is female	-0.37	0.65	0.56
District interaction: Teacher race is black	0.34	0.59	0.57
District interaction: Teacher has only partial certification	-0.69	0.62	0.27
District interaction: School percent FRPL	-0.03	0.02	0.18
District interaction: School report card rating – on one scale	-0.35	0.29	0.22
District interaction: School percent non-white	0.02	0.03	0.50
District interaction: School percent ELL	0.02	0.02	0.27
District interaction: School percent Special Education	-0.02	0.06	0.79
Constant	0.29	0.18	0.12
Random effects			
School	<0.001		
Teacher	0.73		
n			
School	*61*		
Teacher	*88*		

Exhibit C-50. Impact of the NTC Model on Establishing a Culture for Learning – Cohort 2, Both Districts Combined

	Estimate	Standard Error	p-value
Treatment status	-0.14	0.34	0.68
Baseline score	0.07	0.09	0.44
Teacher variables			
Teacher is female CENTERED	-0.28	0.32	0.39
Teacher race is black CENTERED	-0.15	0.25	0.54
Teacher has only partial certification CENTERED	-0.10	0.38	0.79
School variables			
School percent FRPL CENTERED	-0.01	0.01	0.40
School report card rating – on one scale CENTERED	-0.12	0.17	0.48
School percent non-white CENTERED	-0.01	0.02	0.69
School percent ELL CENTERED	-0.01	0.01	0.57
School percent Special Education CENTERED	-0.05	0.03	0.10
Blocking variables			
District A block 3	-0.10	0.56	0.85
District A block 2	0.33	0.60	0.58
District B block 5	-1.16	0.62	0.06
District B block 7	-0.71	0.61	0.24
District B block 8	-1.16	0.54	0.03
District B block 6	-1.36	0.66	0.04
Interactions with district			
Centered district indicator	-1.44	0.47	<0.001
District interaction: Baseline score	0.01	0.18	0.96
District interaction: Teacher is female	1.24	0.64	0.05
District interaction: Teacher race is black	1.65	0.50	<0.001
District interaction: Teacher has only partial certification	0.19	0.74	0.80
District interaction: School percent FRPL	-0.02	0.02	0.28
District interaction: School report card rating – on one scale	-0.39	0.34	0.26
District interaction: School percent non-white	-0.01	0.03	0.87
District interaction: School percent ELL	-0.01	0.02	0.61
District interaction: School percent Special Education	-0.15	0.06	0.01
Constant	0.83	0.26	<0.001
Random effects			
School	0.16		
Teacher	0.74		
n			
School	*69*		
Teacher	*88*		

Exhibit C-51. Impact of the NTC Model on Managing Classroom Procedures – Cohort 2, Both Districts Combined

	Estimate	Standard Error	p-value
Treatment status	0.07	0.23	0.76
Baseline score	0.13	0.12	0.28
Teacher variables			
Teacher is female CENTERED	0.58	0.30	0.05
Teacher race is black CENTERED	-0.16	0.23	0.50
Teacher has only partial certification CENTERED	-0.40	0.35	0.25
School variables			
School percent FRPL CENTERED	-0.02	0.01	0.01
School report card rating – on one scale CENTERED	-0.02	0.11	0.88
School percent non-white CENTERED	0.03	0.01	0.01
School percent ELL CENTERED	0.02	0.01	0.04
School percent Special Education CENTERED	-0.04	0.02	0.07
Blocking variables			
District A block 3	-0.05	0.35	0.89
District A block 2	-0.13	0.46	0.78
District B block 5	-0.45	0.32	0.17
District B block 7	-0.69	0.56	0.22
District B block 8	-0.18	0.45	0.69
District B block 6	-0.78	0.56	0.17
Interactions with district			
Centered district indicator	0.39	0.33	0.24
District interaction: Baseline score	0.19	0.22	0.39
District interaction: Teacher is female	-0.52	0.61	0.39
District interaction: Teacher race is black	-0.28	0.47	0.54
District interaction: Teacher has only partial certification	-0.39	0.67	0.57
District interaction: School percent FRPL	-0.03	0.02	0.15
District interaction: School report card rating – on one scale	-0.29	0.23	0.20
District interaction: School percent non-white	0.04	0.02	0.10
District interaction: School percent ELL	0.03	0.02	0.15
District interaction: School percent Special Education	-0.03	0.05	0.54
Constant	1.05	0.19	<0.001
Random effects			
School	<0.001		
Teacher	0.48		
n			
School	*68*		
Teacher	*80*		

Exhibit C-52. Impact of the NTC Model on Managing Student Behavior – Cohort 2, Both Districts Combined

	Estimate	Standard Error	p-value
Treatment status	0.18	0.24	0.45
Baseline score	0.06	0.09	0.50
Teacher variables			
Teacher is female CENTERED	0.19	0.25	0.45
Teacher race is black CENTERED	-0.16	0.25	0.53
Teacher has only partial certification CENTERED	0.03	0.29	0.92
School variables			
School percent FRPL CENTERED	-0.02	0.01	0.09
School report card rating – on one scale CENTERED	0.03	0.15	0.86
School percent non-white CENTERED	0.03	0.01	0.04
School percent ELL CENTERED	-0.01	0.01	0.42
School percent Special Education CENTERED	-0.04	0.03	0.14
Blocking variables			
District A block 3	-0.97	0.40	0.01
District A block 2	-0.48	0.50	0.34
District B block 5	-0.33	0.41	0.43
District B block 7	-1.00	0.54	0.06
District B block 8	-0.64	0.41	0.12
District B block 6	-2.02	0.57	<0.001
Interactions with district			
Centered district indicator	-0.40	0.34	0.23
District interaction: Baseline score	0.19	0.18	0.31
District interaction: Teacher is female	-0.12	0.50	0.81
District interaction: Teacher race is black	0.41	0.50	0.41
District interaction: Teacher has only partial certification	-0.28	0.56	0.62
District interaction: School percent FRPL	0.02	0.03	0.38
District interaction: School report card rating – on one scale	-0.14	0.30	0.65
District interaction: School percent non-white	-0.02	0.03	0.39
District interaction: School percent ELL	<0.001	0.02	0.91
District interaction: School percent Special Education	-0.05	0.06	0.42
Constant	0.59	0.19	<0.001
Random effects			
School	<0.001		
Teacher	0.69		
n			
School	*69*		
Teacher	*88*		

Exhibit C-53. Impact of the NTC Model on Communicating with Students – Cohort 2, Both Districts Combined

	Estimate	Standard Error	p-value
Treatment status	0.08	0.27	0.76
Baseline score	0.20	0.13	0.11
Teacher variables			
Teacher is female CENTERED	-0.33	0.30	0.27
Teacher race is black CENTERED	-0.39	0.31	0.20
Teacher has only partial certification CENTERED	0.29	0.41	0.49
School variables			
School percent FRPL CENTERED	0.01	0.01	0.49
School report card rating – on one scale CENTERED	0.07	0.17	0.68
School percent non-white CENTERED	-0.02	0.02	0.32
School percent ELL CENTERED	<0.001	0.01	0.82
School percent Special Education CENTERED	<0.001	0.03	0.96
Blocking variables			
District A block 3	0.25	0.42	0.55
District A block 2	0.11	0.44	0.80
District B block 5	-1.28	0.56	0.02
District B block 7	-0.64	0.75	0.39
District B block 8	-1.39	0.61	0.02
District B block 6	-1.64	0.76	0.03
Interactions with district			
Centered district indicator	-1.68	0.45	<0.001
District interaction: Baseline score	0.35	0.25	0.16
District interaction: Teacher is female	1.04	0.59	0.08
District interaction: Teacher race is black	0.51	0.61	0.40
District interaction: Teacher has only partial certification	-0.30	0.80	0.71
District interaction: School percent FRPL	<0.001	0.03	0.94
District interaction: School report card rating – on one scale	-0.23	0.34	0.49
District interaction: School percent non-white	0.01	0.03	0.69
District interaction: School percent ELL	-0.01	0.03	0.83
District interaction: School percent Special Education	0.05	0.07	0.49
Constant	0.83	0.25	<0.001
Random effects			
School	<0.001		
Teacher	0.91		
n			
School	*66*		
Teacher	*87*		

Exhibit C-54. Impact of the NTC Model on Using Questioning and Discussion Techniques – Cohort 2, Both Districts Combined

	Estimate	Standard Error	p-value
Treatment status	0.28	0.28	0.32
Baseline score	-0.05	0.13	0.68
Teacher variables			
Teacher is female CENTERED	0.11	0.26	0.67
Teacher race is black CENTERED	0.04	0.29	0.88
Teacher has only partial certification CENTERED	0.03	0.39	0.94
School variables			
School percent FRPL CENTERED	<0.001	0.01	0.78
School report card rating – on one scale CENTERED	0.07	0.17	0.65
School percent non-white CENTERED	-0.01	0.01	0.58
School percent ELL CENTERED	<0.001	0.01	0.80
School percent Special Education CENTERED	-0.05	0.03	0.10
Blocking variables			
District A block 3	-0.23	0.44	0.60
District A block 2	0.39	0.46	0.40
District B block 5	-0.54	0.54	0.32
District B block 7	-0.99	0.70	0.16
District B block 8	-0.78	0.58	0.18
District B block 6	-1.70	0.74	0.02
Interactions with district			
Centered district indicator	-1.38	0.44	<0.001
District interaction: Baseline score	0.11	0.25	0.65
District interaction: Teacher is female	0.10	0.52	0.85
District interaction: Teacher race is black	0.45	0.58	0.43
District interaction: Teacher has only partial certification	-0.61	0.76	0.42
District interaction: School percent FRPL	-0.01	0.03	0.58
District interaction: School report card rating – on one scale	0.09	0.34	0.79
District interaction: School percent non-white	0.02	0.03	0.59
District interaction: School percent ELL	0.02	0.03	0.46
District interaction: School percent Special Education	0.05	0.06	0.48
Constant	0.97	0.25	<0.001
Random effects			
School	0.43		
Teacher	0.41		
n			
School	*69*		
Teacher	*88*		

Exhibit C-55. Impact of the NTC Model on Engaging Students in Learning – Cohort 2, Both Districts Combined

	Estimate	Standard Error	p-value
Treatment status	0.43	0.28	0.12
Baseline score	-0.06	0.10	0.54
Teacher variables			
Teacher is female CENTERED	0.34	0.30	0.25
Teacher race is black CENTERED	-0.28	0.26	0.29
Teacher has only partial certification CENTERED	-0.25	0.26	0.34
School variables			
School percent FRPL CENTERED	-0.02	0.01	0.06
School report card rating – on one scale CENTERED	-0.07	0.16	0.64
School percent non-white CENTERED	0.01	0.01	0.34
School percent ELL CENTERED	0.01	0.01	0.17
School percent Special Education CENTERED	-0.04	0.03	0.17
Blocking variables			
District A block 3	-0.20	0.37	0.59
District A block 2	0.18	0.69	0.80
District B block 5	-0.26	0.40	0.52
District B block 7	-1.29	0.43	<0.001
District B block 8	-1.17	0.34	<0.001
District B block 6	-1.96	0.50	<0.001
Interactions with district			
Centered district indicator	-0.90	0.34	0.01
District interaction: Baseline score	0.16	0.20	0.44
District interaction: Teacher is female	0.29	0.59	0.63
District interaction: Teacher race is black	1.02	0.54	0.06
District interaction: Teacher has only partial certification	0.10	0.55	0.86
District interaction: School percent FRPL	-0.01	0.02	0.75
District interaction: School report card rating – on one scale	-0.30	0.29	0.30
District interaction: School percent non-white	-0.04	0.03	0.14
District interaction: School percent ELL	0.05	0.02	0.01
District interaction: School percent Special Education	0.02	0.06	0.73
Constant	0.83	0.20	<0.001
Random effects			
School	<0.001		
Teacher	0.66		
n			
School	*68*		
Teacher	*87*		

Exhibit C-56. Impact of the NTC Model on Using Assessment in Instruction – Cohort 2, Both Districts Combined

	Estimate	Standard Error	p-value
Treatment status	0.18	0.30	0.54
Baseline score	0.05	0.11	0.68
Teacher variables			
Teacher is female CENTERED	0.28	0.26	0.29
Teacher race is black CENTERED	-0.42	0.32	0.19
Teacher has only partial certification CENTERED	-0.37	0.30	0.22
School variables			
School percent FRPL CENTERED	<0.001	0.01	0.97
School report card rating – on one scale CENTERED	0.05	0.14	0.74
School percent non-white CENTERED	0.01	0.01	0.51
School percent ELL CENTERED	0.01	0.01	0.52
School percent Special Education CENTERED	-0.03	0.03	0.30
Blocking variables			
District A block 3	-0.69	0.40	0.09
District A block 2	0.43	0.71	0.54
District B block 5	-0.42	0.36	0.24
District B block 7	-1.97	0.70	<0.001
District B block 8	-0.83	0.42	0.05
District B block 6	-3.06	0.71	<0.001
Interactions with district			
Centered district indicator	-1.18	0.32	<0.001
District interaction: Baseline score	0.34	0.24	0.15
District interaction: Teacher is female	-0.28	0.52	0.60
District interaction: Teacher race is black	0.92	0.66	0.16
District interaction: Teacher has only partial certification	0.11	0.61	0.86
District interaction: School percent FRPL	0.03	0.03	0.22
District interaction: School report card rating – on one scale	0.15	0.26	0.58
District interaction: School percent non-white	-0.05	0.03	0.07
District interaction: School percent ELL	0.03	0.03	0.23
District interaction: School percent Special Education	0.02	0.06	0.66
Constant	0.85	0.19	<0.001
Random effects			
School	<0.001		
Teacher	0.84		
n			
School	*69*		
Teacher	*88*		

Cohort 2, District A

Exhibit C-57. Impact of the NTC Model on Creating an Environment of Respect and Rapport – Cohort 2, District A

	Estimate	Standard Error	p-value
Treatment status	-0.19	0.35	0.58
Baseline score	0.07	0.15	0.64
Teacher variables			
Teacher is female CENTERED	-0.48	0.45	0.29
Teacher race is black CENTERED	-0.21	0.35	0.54
Teacher has only partial certification CENTERED	-0.15	0.32	0.63
School variables			
School percent FRPL CENTERED	-0.03	0.02	0.04
School report card rating – on one scale CENTERED	-0.24	0.24	0.31
School percent non-white CENTERED	0.03	0.02	0.22
School percent ELL CENTERED	0.02	0.01	0.27
School percent Special Education CENTERED	-0.09	0.04	0.05
Blocking variables			
District A block 3	-0.05	0.34	0.89
District A block 2	0.04	0.50	0.93
Constant	0.19	0.21	0.37
Random effects			
School	<0.001		
Teacher	0.80		
n			
School	*33*		
Teacher	*44*		

Exhibit C-58. Impact of the NTC Model on Establishing a Culture for Learning – Cohort 2, District A

	Estimate	Standard Error	p-value
Treatment status	-0.27	0.50	0.59
Baseline score	0.06	0.14	0.68
Teacher variables			
Teacher is female CENTERED	0.34	0.50	0.51
Teacher race is black CENTERED	0.67	0.40	0.09
Teacher has only partial certification CENTERED	0.07	0.39	0.86
School variables			
School percent FRPL CENTERED	-0.02	0.02	0.22
School report card rating – on one scale CENTERED	-0.30	0.29	0.30
School percent non-white CENTERED	-0.01	0.03	0.78
School percent ELL CENTERED	-0.01	0.02	0.53
School percent Special Education CENTERED	-0.12	0.05	0.02
Blocking variables			
District A block 3	-0.06	0.56	0.91
District A block 2	0.31	0.58	0.60
Constant	0.17	0.32	0.60
Random effects			
School	0.49		
Teacher	0.78		
n			
School	*33*		
Teacher	*44*		

Exhibit C-59. Impact of the NTC Model on Managing Classroom Procedures – Cohort 2, District A

	Estimate	Standard Error	p-value
Treatment status	-0.37	0.34	0.28
Baseline score	0.20	0.13	0.12
Teacher variables			
Teacher is female CENTERED	0.27	0.24	0.26
Teacher race is black CENTERED	-0.36	0.27	0.19
Teacher has only partial certification CENTERED	-0.43	0.29	0.13
School variables			
School percent FRPL CENTERED	-0.04	0.02	0.02
School report card rating – on one scale CENTERED	-0.10	0.18	0.57
School percent non-white CENTERED	0.06	0.02	<0.001
School percent ELL CENTERED	0.02	0.02	0.24
School percent Special Education CENTERED	-0.08	0.04	0.05
Blocking variables			
District A block 3	-0.12	0.37	0.74
District A block 2	-0.25	0.48	0.61
Constant	1.48	0.23	<0.001
Random effects			
School	<0.001		
Teacher	0.42		
n			
School	*32*		
Teacher	*37*		

Exhibit C-60. Impact of the NTC Model on Managing Student Behavior – Cohort 2, District A

	Estimate	Standard Error	p-value
Treatment status	-0.19	0.31	0.54
Baseline score	0.13	0.13	0.32
Teacher variables			
Teacher is female CENTERED	0.13	0.37	0.73
Teacher race is black CENTERED	0.04	0.35	0.91
Teacher has only partial certification CENTERED	0.03	0.28	0.93
School variables			
School percent FRPL CENTERED	-0.01	0.02	0.58
School report card rating – on one scale CENTERED	-0.01	0.24	0.98
School percent non-white CENTERED	0.02	0.02	0.27
School percent ELL CENTERED	-0.02	0.02	0.31
School percent Special Education CENTERED	-0.07	0.05	0.16
Blocking variables			
District A block 3	-1.00	0.36	0.01
District A block 2	-0.47	0.53	0.37
Constant	0.55	0.24	0.02
Random effects			
School	<0.001		
Teacher	0.74		
n			
School	*33*		
Teacher	*44*		

Exhibit C-61. Impact of the NTC Model on Communicating with Students – Cohort 2, District A

	Estimate	Standard Error	p-value
Treatment status	0.11	0.38	0.77
Baseline score	0.33	0.18	0.06
Teacher variables			
Teacher is female CENTERED	0.25	0.38	0.52
Teacher race is black CENTERED	-0.10	0.36	0.78
Teacher has only partial certification CENTERED	0.11	0.41	0.80
School variables			
School percent FRPL CENTERED	0.01	0.02	0.67
School report card rating – on one scale CENTERED	-0.06	0.29	0.85
School percent non-white CENTERED	-0.01	0.03	0.71
School percent ELL CENTERED	<0.001	0.02	0.90
School percent Special Education CENTERED	0.03	0.06	0.56
Blocking variables			
District A block 3	0.30	0.46	0.51
District A block 2	0.19	0.48	0.69
Constant	-0.04	0.30	0.89
Random effects			
School	0.18		
Teacher	0.84		
n			
School	*33*		
Teacher	*43*		

Exhibit C-62. Impact of the NTC Model on Using Questioning and Discussion Techniques – Cohort 2, District A

	Estimate	Standard Error	p-value
Treatment status	0.01	0.45	0.99
Baseline score	-0.07	0.17	0.67
Teacher variables			
Teacher is female CENTERED	-0.31	0.24	0.21
Teacher race is black CENTERED	0.31	0.22	0.17
Teacher has only partial certification CENTERED	<0.001	0.27	0.99
School variables			
School percent FRPL CENTERED	<0.001	0.02	0.89
School report card rating – on one scale CENTERED	0.11	0.31	0.74
School percent non-white CENTERED	<0.001	0.03	0.99
School percent ELL CENTERED	0.01	0.03	0.71
School percent Special Education CENTERED	-0.03	0.05	0.58
Blocking variables			
District A block 3	-0.33	0.56	0.56
District A block 2	0.24	0.57	0.68
Constant	0.38	0.35	0.27
Random effects			
School	1.21		
Teacher	0.11		
n			
School	*33*		
Teacher	*44*		

Exhibit C-63. Impact of the NTC Model on Engaging Students in Learning – Cohort 2, District A

	Estimate	Standard Error	p-value
Treatment status	0.34	0.38	0.37
Baseline score	-0.03	0.18	0.87
Teacher variables			
Teacher is female CENTERED	0.41	0.38	0.29
Teacher race is black CENTERED	0.16	0.36	0.66
Teacher has only partial certification CENTERED	-0.43	0.39	0.26
School variables			
School percent FRPL CENTERED	-0.03	0.02	0.21
School report card rating – on one scale CENTERED	-0.39	0.29	0.19
School percent non-white CENTERED	-0.01	0.03	0.79
School percent ELL CENTERED	0.04	0.02	0.08
School percent Special Education CENTERED	0.02	0.06	0.74
Blocking variables			
District A block 3	-0.15	0.46	0.74
District A block 2	0.15	0.49	0.77
Constant	0.50	0.30	0.09
Random effects			
School	0.35		
Teacher	0.62		
n			
School	*32*		
Teacher	*43*		

Exhibit C-64. Impact of the NTC Model on Using Assessment in Instruction – Cohort 2, District A

	Estimate	Standard Error	p-value
Treatment status	0.33	0.45	0.46
Baseline score	0.22	0.16	0.16
Teacher variables			
Teacher is female CENTERED	0.14	0.39	0.72
Teacher race is black CENTERED	0.01	0.40	0.97
Teacher has only partial certification CENTERED	-0.33	0.38	0.39
School variables			
School percent FRPL CENTERED	0.02	0.02	0.43
School report card rating – on one scale CENTERED	0.13	0.25	0.61
School percent non-white CENTERED	-0.02	0.02	0.42
School percent ELL CENTERED	0.03	0.02	0.24
School percent Special Education CENTERED	-0.02	0.05	0.70
Blocking variables			
District A block 3	-0.70	0.44	0.12
District A block 2	0.46	0.72	0.52
Constant	0.20	0.26	0.44
Random effects			
School	<0.001		
Teacher	0.93		
n			
School	*33*		
Teacher	*43*		

Cohort 2, District B

Exhibit C-65. Impact of the NTC Model on Creating an Environment of Respect and Rapport – Cohort 2, District B

	Estimate	Standard Error	p-value
Treatment status	0.07	0.36	0.85
Baseline score	-0.16	0.19	0.40
Teacher variables			
Teacher is female CENTERED	-0.08	0.47	0.86
Teacher race is black CENTERED	-0.52	0.46	0.26
Teacher has only partial certification CENTERED	0.45	0.56	0.43
School variables			
School percent FRPL CENTERED	-0.01	0.01	0.65
School report card rating – on one scale CENTERED	0.11	0.15	0.47
School percent non-white CENTERED	0.01	0.01	0.54
School percent ELL CENTERED	<0.001	0.01	0.74
School percent Special Education CENTERED	-0.08	0.04	0.09
Blocking variable			
District B block 5	<0.001	0.30	0.99
District B block 7	-0.39	0.62	0.53
District B block 8	0.16	0.41	0.69
District B block 6	-1.07	0.83	0.19
Constant	0.33	0.32	0.30
Random effects			
School	<0.001		
Teacher	0.66		
n			
School	*36*		
Teacher	*44*		

Exhibit C-66. Impact of the NTC Model on Establishing a Culture for Learning – Cohort 2, District B

	Estimate	Standard Error	p-value
Treatment status	-0.04	0.37	0.92
Baseline score	0.07	0.10	0.51
Teacher variables			
Teacher is female CENTERED	-0.87	0.34	0.01
Teacher race is black CENTERED	-1.02	0.28	<0.001
Teacher has only partial certification CENTERED	-0.27	0.61	0.66
School variables			
School percent FRPL CENTERED	<0.001	0.01	0.97
School report card rating – on one scale CENTERED	0.08	0.15	0.62
School percent non-white CENTERED	<0.001	0.02	0.97
School percent ELL CENTERED	<0.001	0.01	0.95
School percent Special Education CENTERED	0.02	0.03	0.48
Blocking variables			
District B block 5	-1.14	0.62	0.07
District B block 7	-0.77	0.60	0.20
District B block 8	-1.24	0.56	0.03
District B block 6	-1.50	0.65	0.02
Constant	1.50	0.40	<0.001
Random effects			
School	<0.001		
Teacher	0.52		
n			
School	*36*		
Teacher	*44*		

Exhibit C-67. Impact of the NTC Model on Managing Classroom Procedures – Cohort 2, District B

	Estimate	Standard Error	p-value
Treatment status	0.60	0.25	0.02
Baseline score	0.08	0.21	0.69
Teacher variables			
Teacher is female CENTERED	0.84	0.55	0.12
Teacher race is black CENTERED	0.07	0.35	0.84
Teacher has only partial certification CENTERED	-0.35	0.58	0.55
School variables			
School percent FRPL CENTERED	-0.01	0.01	0.11
School report card rating – on one scale CENTERED	0.19	0.12	0.10
School percent non-white CENTERED	0.02	0.01	0.13
School percent ELL CENTERED	<0.001	0.01	0.79
School percent Special Education CENTERED	-0.05	0.02	0.04
Blocking variables			
District B block 5	-0.50	0.31	0.10
District B block 7	-1.06	0.53	0.04
District B block 8	-0.45	0.41	0.27
District B block 6	-1.24	0.59	0.03
Constant	0.60	0.28	0.03
Random effects			
School	<0.001		
Teacher	0.47		
n			
School	*36*		
Teacher	*43*		

Exhibit C-68. Impact of the NTC Model on Managing Student Behavior – Cohort 2, District B

	Estimate	Standard Error	p-value
Treatment status	0.84	0.34	0.01
Baseline score	-0.01	0.13	0.93
Teacher variables			
Teacher is female CENTERED	0.21	0.32	0.50
Teacher race is black CENTERED	-0.30	0.35	0.39
Teacher has only partial certification CENTERED	-0.01	0.40	0.98
School variables			
School percent FRPL CENTERED	-0.03	0.01	0.01
School report card rating – on one scale CENTERED	0.16	0.12	0.16
School percent non-white CENTERED	0.05	0.02	<0.001
School percent ELL CENTERED	-0.01	0.01	0.29
School percent Special Education CENTERED	-0.05	0.03	0.06
Blocking variables			
District B block 5	-0.35	0.39	0.36
District B block 7	-1.45	0.46	<0.001
District B block 8	-0.98	0.36	0.01
District B block 6	-2.52	0.50	<0.001
Constant	0.45	0.28	0.11
Random effects			
School	<0.001		
Teacher	0.58		
n			
School	*36*		
Teacher	*44*		

Exhibit C-69. Impact of the NTC Model on Communicating with Students – Cohort 2, District B

	Estimate	Standard Error	p-value
Treatment status	-0.10	0.41	0.81
Baseline score	0.02	0.17	0.89
Teacher variables			
Teacher is female CENTERED	-0.84	0.44	0.05
Teacher race is black CENTERED	-0.67	0.47	0.15
Teacher has only partial certification CENTERED	0.48	0.67	0.47
School variables			
School percent FRPL CENTERED	0.01	0.02	0.56
School report card rating – on one scale CENTERED	0.16	0.18	0.38
School percent non-white CENTERED	-0.02	0.02	0.21
School percent ELL CENTERED	0.01	0.01	0.64
School percent Special Education CENTERED	-0.02	0.04	0.70
Blocking variables			
District B block 5	-1.28	0.53	0.02
District B block 7	-0.52	0.73	0.48
District B block 8	-1.28	0.60	0.03
District B block 6	-1.49	0.76	0.05
Constant	1.75	0.40	<0.001
Random effects			
School	<0.001		
Teacher	0.80		
n			
School	*36*		
Teacher	*44*		

Exhibit C-70. Impact of the NTC Model on Using Questioning and Discussion Techniques – Cohort 2, District B

	Estimate	Standard Error	p-value
Treatment status	0.35	0.26	0.17
Baseline score	-0.06	0.11	0.57
Teacher variables			
Teacher is female CENTERED	0.15	0.40	0.70
Teacher race is black CENTERED	-0.32	0.37	0.39
Teacher has only partial certification CENTERED	0.18	0.61	0.77
School variables			
School percent FRPL CENTERED	<0.001	0.01	0.80
School report card rating – on one scale CENTERED	-0.02	0.15	0.89
School percent non-white CENTERED	-0.01	0.01	0.55
School percent ELL CENTERED	-0.01	0.01	0.37
School percent Special Education CENTERED	-0.07	0.02	<0.001
Blocking variables			
District B block 5	-0.58	0.40	0.15
District B block 7	-1.04	0.56	0.06
District B block 8	-0.79	0.40	0.05
District B block 6	-1.97	0.52	<0.001
Constant	1.65	0.37	<0.001
Random effects			
School	<0.001		
Teacher	0.49		
n			
School	*36*		
Teacher	*44*		

Exhibit C-71. Impact of the NTC Model on Engaging Students in Learning – Cohort 2, District B

	Estimate	Standard Error	P-value
Treatment status	0.27	0.25	0.27
Baseline score	-0.15	0.13	0.26
Teacher variables			
Teacher is female CENTERED	0.24	0.36	0.51
Teacher race is black CENTERED	-0.79	0.29	0.01
Teacher has only partial certification CENTERED	-0.27	0.45	0.54
School variables			
School percent FRPL CENTERED	-0.01	0.01	0.12
School report card rating – on one scale CENTERED	0.09	0.11	0.44
School percent non-white CENTERED	0.03	0.01	0.01
School percent ELL CENTERED	-0.01	0.01	0.15
School percent Special Education CENTERED	-0.05	0.02	0.04
Blocking variables			
District B block 5	-0.29	0.41	0.48
District B block 7	-1.14	0.43	0.01
District B block 8	-1.08	0.34	<0.001
District B block 6	-1.85	0.50	<0.001
Constant	1.36	0.26	<0.001
Random effects			
School	<0.001		
Teacher	0.37		
n			
School	*36*		
Teacher	*44*		

Exhibit C-72. Impact of the NTC Model on Using Assessment in Instruction – Cohort 2, District B

	Estimate	Standard Error	P-value
Treatment status	-0.07	0.37	0.85
Baseline score	-0.12	0.18	0.53
Teacher variables			
Teacher is female CENTERED	0.42	0.37	0.26
Teacher race is black CENTERED	-0.87	0.51	0.09
Teacher has only partial certification CENTERED	-0.34	0.54	0.53
School variables			
School percent FRPL CENTERED	-0.01	0.01	0.33
School report card rating – on one scale CENTERED	-0.06	0.13	0.62
School percent non-white CENTERED	0.03	0.02	0.07
School percent ELL CENTERED	-0.01	0.01	0.66
School percent Special Education CENTERED	-0.03	0.04	0.39
Blocking variables			
District B block 5	-0.37	0.35	0.30
District B block 7	-1.77	0.77	0.02
District B block 8	-0.66	0.48	0.17
District B block 6	-2.78	0.81	<0.001
Constant	1.54	0.28	<0.001
Random effects			
School	<0.001		
Teacher	0.75		
n			
School	*36*		
Teacher	*44*		

Appendix D. Full Student Achievement Model Results

Both Cohorts and Districts Combined

Exhibit D-1. Impact After Two Years of Mentoring – Both Cohorts and Districts Combined, Math

	Estimate	Standard Error	p-value
Treatment indicator	0.145	0.05	0.003
Student variables			
Prior math score	0.706	0.011	<0.001
Grade 5	0.109	0.046	0.018
Grade 6	0.024	0.054	0.656
Grade 7	0.040	0.062	0.52
Grade 8	0.132	0.065	0.042
Student race is black CENTERED	-0.232	0.036	<0.001
Student Hispanic CENTERED	-0.107	0.028	<0.001
Student FRPL CENTERED	-0.132	0.034	<0.001
Student special education CENTERED	-0.188	0.030	<0.001
Student limited English CENTERED	-0.074	0.029	0.011
Student female CENTERED	0.008	0.018	0.668
Teacher variables			
Teacher black CENTERED	-0.011	0.098	0.912
Teacher Bachelor's degree CENTERED	0.089	0.053	0.093
Teacher partially certified CENTERED	0.328	0.154	0.033
Teacher female CENTERED	0.171	0.068	0.012
School variables			
School percent FRPL CENTERED	0.001	0.004	0.807
School Report Card Rating CENTERED	-0.009	0.025	0.725
School percent minority CENTERED	-0.001	0.005	0.768
School percent ELL CENTERED	-0.003	0.002	0.203
School percent IEP CENTERED	0.002	0.008	0.771
Blocking variables			
District A block 1	0.375	0.135	0.005
District A block 2	<0.001	0.148	0.999
District B block 5	0.042	0.067	0.524
District B block 8	0.016	0.088	0.856
Interactions with district			
Centered district indicator	-0.347	0.17	0.041
District interaction: Math pretest	-0.155	0.019	<0.001
District interaction: Grade 5	0.39	0.123	0.002
District interaction: Grade 6	0.243	0.144	0.091
District interaction: Grade 7	0.545	0.167	0.001
District interaction: Grade 8	0.272	0.172	0.114
District interaction: Student black	0.089	0.052	0.087

Exhibit D-1. Impact After Two Years of Mentoring – Both Cohorts and Districts Combined, Math (continued)

	Estimate	Standard Error	p-value
District interaction: Student Hispanic	0.055	0.049	0.263
District interaction: Student FRPL	0.064	0.05	0.197
District interaction: Student SPED	0.02	0.048	0.680
District interaction: Student LEP	0.014	0.061	0.823
District interaction: Student female	-0.034	0.03	0.255
District interaction: Teacher black	-0.227	0.145	0.118
District interaction: Teacher Bachelor's degree	-0.549	0.112	<0.001
District interaction: Teacher certification	-0.300	0.174	0.084
District interaction: Teacher female	0.056	0.127	0.661
District interaction: School percent FRPL	0.005	0.008	0.543
District interaction: School rating	0.172	0.076	0.024
District interaction: School percent non-white	0.004	0.010	0.726
District interaction: School percent student LEP	0.010	0.005	0.060
District interaction: School percent SPED	-0.030	0.017	0.086
Interactions with cohort			
Centered cohort indicator	0.031	0.118	0.793
Cohort interaction: Math pretest	0.033	0.023	0.147
Cohort interaction: Grade 5	-0.067	0.090	0.454
Cohort interaction: Grade 6	-0.013	0.103	0.898
Cohort interaction: Grade 7	1.042	0.314	0.001
Cohort interaction: Grade 8	0.513	0.123	<0.001
Cohort interaction: Student black	0.236	0.073	0.001
Cohort interaction: Student Hispanic	-0.073	0.057	0.198
Cohort interaction: Student FRPL	0.031	0.068	0.649
Cohort interaction: Student SPED	-0.054	0.060	0.364
Cohort interaction: Student LEP	0.132	0.058	0.024
Cohort interaction: Student female	0.007	0.036	0.847
Cohort interaction: Teacher black	-0.096	0.196	0.626
Cohort interaction: Teacher Bachelor's degree	0.120	0.107	0.264
Cohort interaction: Teacher certification	0.211	0.304	0.487
Cohort interaction: Teacher female	0.090	0.131	0.492
Cohort interaction: School percent FRPL	-0.006	0.007	0.458
Cohort interaction: School rating	-0.076	0.046	0.097
Cohort interaction: School percent non-white	0.004	0.010	0.713
Cohort interaction: School percent student LEP	0.011	0.004	0.008
Cohort interaction: School percent SPED	-0.002	0.015	0.910
Cohort interaction: District A block 1	0.572	0.238	0.016
Cohort interaction: District A block 2	0.007	0.258	0.978
Cohort interaction: District B block 5	-0.120	0.123	0.329
Cohort interaction: District B block 8	-0.210	0.184	0.254

Exhibit D-1. Impact After Two Years of Mentoring – Both Cohorts and Districts Combined, Math (concluded)

	Estimate	Standard Error	p-value
District-by-Cohort interaction			
District by cohort interaction	-0.746	0.326	0.022
District by cohort interaction: Math pretest	0.060	0.038	0.115
District by cohort interaction: Grade 5	0.897	0.246	<0.001
District by cohort interaction: Grade 6	0.593	0.292	0.042
District by cohort interaction: Grade 8	0.509	0.336	0.13
District by cohort interaction: Student black	-0.141	0.104	0.175
District by cohort interaction: Student Hispanic	0.179	0.098	0.068
District by cohort interaction: Student FRPL	0.124	0.100	0.214
District by cohort interaction: Student SPED	0.161	0.095	0.092
District by cohort interaction: Student LEP	-0.448	0.123	<0.001
District by cohort interaction: Student female	0.029	0.060	0.628
District by cohort interaction: Teacher black	-0.669	0.288	0.020
District by cohort interaction: Teacher Bachelor's degree	-1.162	0.238	<0.001
District by cohort interaction: Teacher certification	0.316	0.348	0.364
District by cohort interaction: Teacher female	0.317	0.249	0.203
District by cohort interaction: School percent FRPL	0.043	0.016	0.008
District by cohort interaction: School rating	0.295	0.130	0.023
District by cohort interaction: School percent non-white	-0.027	0.020	0.187
District by cohort interaction: School percent student LEP	0.010	0.009	0.247
District by cohort interaction: School percent SPED	-0.010	0.032	0.761
Constant	-0.123	0.066	0.062
Random effects			
School	0.017		
Teacher	0.011		
Student	0.236		
n			
Schools	86		
Teachers	129		
Students	4972		

Exhibit D-2. Impact After Two Years of Mentoring – Both Cohorts and Districts Combined, Reading

	Estimate	Standard Error	P-value
Treatment indicator	0.088	0.039	0.026
Student variables			
Prior reading score	0.709	0.013	<0.001
Grade 5	-0.021	0.036	0.560
Grade 6	0.037	0.038	0.320
Grade 7	-0.037	0.049	0.446
Grade 8	-0.020	0.049	0.692
Student race is black CENTERED	-0.114	0.038	0.003
Student Hispanic CENTERED	-0.006	0.031	0.839
Student FRPL CENTERED	-0.090	0.033	0.007
Student special education CENTERED	-0.290	0.028	<0.001
Student limited English CENTERED	-0.117	0.031	<0.001
Student female CENTERED	0.036	0.018	0.047
Teacher variables			
Teacher black CENTERED	0.129	0.067	0.055
Teacher Bachelor's degree CENTERED	-0.021	0.039	0.582
Teacher partially certified CENTERED	0.013	0.120	0.915
Teacher female CENTERED	0.071	0.050	0.155
School variables			
School percent FRPL CENTERED	-0.006	0.003	0.022
School Report Card Rating CENTERED	0.007	0.022	0.746
School percent minority CENTERED	0.007	0.004	0.066
School percent ELL CENTERED	-0.005	0.002	0.011
School percent IEP CENTERED	-0.001	0.006	0.849
Blocking Variables			
District A block 1	0.139	0.105	0.188
District A block 2	-0.057	0.109	0.602
District B block 5	0.001	0.064	0.982
District B block 8	0.181	0.070	0.009
Interactions with district			
District indicator	-0.280	0.141	0.047
District interaction: Reading pretest	-0.026	0.018	0.153
District interaction: Grade 5	0.358	0.104	0.001
District interaction: Grade 6	0.163	0.105	0.120
District interaction: Grade 7	0.415	0.125	0.001
District interaction: Grade 8	0.287	0.135	0.033
District interaction: Student black	-0.013	0.053	0.803
District interaction: Student Hispanic	-0.070	0.050	0.161
District interaction: Student FRPL	0.024	0.049	0.631
District interaction: Student SPED	0.015	0.044	0.728

Exhibit D-2. Impact After Two Years of Mentoring – Both Cohorts and Districts Combined, Reading (continued)

	Estimate	Standard Error	P-value
District interaction: Student LEP	-0.037	0.056	0.504
District interaction: Student female	0.026	0.028	0.356
District interaction: Teacher black	-0.041	0.083	0.621
District interaction: Teacher Bachelor's degree	-0.002	0.059	0.967
District interaction: Teacher certification	-0.041	0.134	0.759
District interaction: Teacher female	-0.037	0.147	0.802
District interaction: School percent FRPL	-0.003	0.007	0.671
District interaction: School rating	0.012	0.058	0.843
District interaction: School percent non-white	-0.002	0.009	0.829
District interaction: School percent student LEP	0.013	0.005	0.005
District interaction: School percent SPED	-0.023	0.014	0.099
Interactions with cohort			
Cohort indicator	0.189	0.083	0.022
Cohort interaction: Reading pretest	-0.065	0.025	0.011
Cohort interaction: Grade 5	-0.078	0.067	0.244
Cohort interaction: Grade 6	0.047	0.068	0.490
Cohort interaction: Grade 7	0.744	0.224	0.001
Cohort interaction: Grade 8	0.027	0.091	0.763
Cohort interaction: Student black	-0.050	0.072	0.488
Cohort interaction: Student Hispanic	0.043	0.049	0.384
Cohort interaction: Student FRPL	-0.040	0.065	0.538
Cohort interaction: Student SPED	-0.200	0.056	<0.001
Cohort interaction: Student LEP	0.076	0.061	0.216
Cohort interaction: Student female	0.017	0.036	0.639
Cohort interaction: Teacher black	0.576	0.134	<0.001
Cohort interaction: Teacher Bachelor's degree	0.052	0.083	0.531
Cohort interaction: Teacher certification	0.028	0.235	0.905
Cohort interaction: Teacher female	0.092	0.091	0.316
Cohort interaction: School percent FRPL	-0.007	0.005	0.196
Cohort interaction: School rating	-0.056	0.034	0.097
Cohort interaction: School percent non-white	-0.001	0.007	0.854
Cohort interaction: School percent student LEP	0.005	0.003	0.097
Cohort interaction: School percent SPED	<0.001	0.009	0.995
Cohort interaction: District A block 1	-0.121	0.172	0.481
Cohort interaction: District A block 2	-0.337	0.182	0.065
Cohort interaction: District B block 5	-0.149	0.100	0.135
Cohort interaction: District B block 8	-0.209	0.147	0.155
District-by-cohort interactions			
District-by-cohort interaction	-0.733	0.272	0.007
District-by-cohort interaction: Reading pretest	0.012	0.037	0.739

Exhibit D-2. Impact After Two Years of Mentoring – Both Cohorts and Districts Combined, Reading (concluded)

	Estimate	Standard Error	P-value
District-by-cohort interaction: Grade 5	0.789	0.206	<0.001
District-by-cohort interaction: Grade 6	0.850	0.209	<0.001
District-by-cohort interaction: Grade 8	0.666	0.264	0.012
District-by-cohort interaction: Student black	0.052	0.084	0.538
District-by-cohort interaction: Student Hispanic	0.124	0.097	0.197
District-by-cohort interaction: Student FRPL	0.167	0.087	0.055
District-by-cohort interaction: Student SPED	0.012	0.037	0.739
District-by-cohort interaction: Student LEP	-0.079	0.111	0.476
District-by-cohort interaction: Student female	-0.102	0.056	0.067
District-by-cohort interaction: Teacher black	-0.814	0.169	<0.001
District-by-cohort interaction: Teacher Bachelor's degree	-0.090	0.124	0.466
District-by-cohort interaction: Teacher certification	0.155	0.258	0.548
District-by-cohort interaction: Teacher female	-0.115	0.306	0.707
District-by-cohort interaction: School percent FRPL	-0.001	0.014	0.938
District-by-cohort interaction: School rating	0.049	0.092	0.594
District-by-cohort interaction: School percent non-white	0.009	0.017	0.613
District-by-cohort interaction: School percent student LEP	-0.001	0.006	0.884
District-by-cohort interaction: School percent SPED	0.005	0.022	0.820
Constant	-0.022	0.052	0.675
Random effects			
School	0.021		
Teacher	<0.001		
Student	0.274		
n			
School	*99*		
Teacher	*149*		

Both Cohorts Combined, District A

Exhibit D-3. Impact After Two Years of Mentoring – District A Both Cohorts Combined, Math

	Estimate	Standard Error	p-value
Treatment indicator	-0.010	0.066	0.880
Student variables			
Prior math score	0.556	0.014	<0.001
Grade 5	0.458	0.103	<0.001
Grade 6	0.221	0.115	0.054
Grade 7	0.472	0.124	<0.001
Grade 8	0.301	0.125	0.016
Student race is black CENTERED	-0.148	0.035	<0.001
Student Hispanic CENTERED	-0.055	0.037	0.137
Student FRPL CENTERED	-0.074	0.034	0.029
Student special education CENTERED	-0.165	0.035	<0.001
Student limited English CENTERED	-0.061	0.050	0.223
Student female CENTERED	-0.028	0.022	0.211
Teacher variables			
Teacher black CENTERED	-0.230	0.072	0.001
Teacher Bachelor's degree CENTERED	-0.432	0.069	<0.001
Teacher partially certified CENTERED	0.039	0.055	0.484
Teacher female CENTERED	0.184	0.065	0.005
School variables			
School percent FRPL CENTERED	0.003	0.005	0.572
School Report Card Rating CENTERED	0.159	0.043	<0.001
School percent minority CENTERED	0.003	0.006	0.593
School percent ELL CENTERED	0.009	0.003	0.001
School percent IEP CENTERED	-0.025	0.010	0.009
Blocking variables			
District A block 1	0.317	0.080	<0.001
District A block 2	0.028	0.082	0.733
Interactions with cohort			
Cohort indictor	-0.598	0.245	0.015
Cohort interaction: Math pretest	0.099	0.028	<0.001
Cohort interaction: Grade 5	0.764	0.206	<0.001
Cohort interaction: Grade 6	0.471	0.238	0.048
Cohort interaction: Grade 7	0.601	0.263	0.022
Cohort interaction: Grade 8	0.759	0.256	0.003
Cohort interaction: Student black	0.087	0.070	0.211
Cohort interaction: Student Hispanic	0.106	0.075	0.154
Cohort interaction: Student FRPL	0.154	0.068	0.024
Cohort interaction: Student SPED	0.119	0.069	0.085
Cohort interaction: Student LEP	-0.306	0.100	0.002

Exhibit D-3. Impact After Two Years of Mentoring – District A Both Cohorts Combined, Math (concluded)

	Estimate	Standard Error	p-value
Cohort interaction: Student female	0.032	0.044	0.477
Cohort interaction: Teacher black	-0.784	0.144	<0.001
Cohort interaction: Teacher Bachelor's degree	-0.976	0.143	<0.001
Cohort interaction: Teacher certification	0.377	0.133	0.005
Cohort interaction: Teacher female	0.335	0.136	0.014
Cohort interaction: School percent FRPL	0.029	0.009	0.002
Cohort interaction: School rating	0.198	0.085	0.020
Cohort interaction: School percent non-white	-0.009	0.012	0.468
Cohort interaction: School percent student LEP	0.013	0.006	0.023
Cohort interaction: School percent SPED	-0.010	0.019	0.583
Cohort interaction: District A block 1	0.674	0.162	<0.001
Cohort interaction: District A block 2	0.219	0.184	0.233
Constant	-0.284	0.135	0.035
Random effects			
School	<0.001		
Teacher	0.005		
Student	0.206		
n			
Schools	31		
Teachers	48		
Students	1793		

Exhibit D-4. Impact After Two Years of Mentoring – District A Both Cohorts Combined, Reading

	Estimate	Standard Error	p-value
Treatment indicator	0.045	0.056	0.424
Student variables			
Prior reading score	0.684	0.014	<0.001
Grade 5	0.330	0.101	0.001
Grade 6	0.197	0.101	0.052
Grade 7	0.398	0.110	<0.001
Grade 8	0.309	0.122	0.011
Student race is black CENTERED	-0.126	0.040	0.002
Student Hispanic CENTERED	-0.079	0.043	0.063
Student FRPL CENTERED	-0.069	0.038	0.071
Student special education CENTERED	-0.273	0.035	<0.001
Student limited English CENTERED	-0.149	0.049	0.002
Student female CENTERED	0.060	0.023	0.008
Teacher variables			
Teacher black CENTERED	0.075	0.045	0.096
Teacher Bachelor's degree CENTERED	-0.024	0.042	0.569
Teacher partially certified CENTERED	-0.017	0.048	0.723
Teacher female CENTERED	0.090	0.118	0.445
School constant			
School percent FRPL CENTERED	-0.007	0.005	0.151
School Report Card Rating CENTERED	0.029	0.041	0.483
School percent minority CENTERED	0.002	0.006	0.739
School percent ELL CENTERED	0.010	0.003	0.001
School percent IEP CENTERED	-0.026	0.010	0.006
Blocking Variables			
District A block 1	0.150	0.078	0.054
District A block 2	-0.043	0.080	0.593
Interactions with cohort			
Cohort indicator	-0.569	0.244	0.019
Cohort interaction: Reading pretest	-0.057	0.028	0.041
Cohort interaction: Grade 5	0.704	0.201	<0.001
Cohort interaction: Grade 6	0.846	0.203	<0.001
Cohort interaction: Grade 7	0.777	0.216	<0.001
Cohort interaction: Grade 8	0.778	0.242	0.001
Cohort interaction: Student black	-0.008	0.079	0.916
Cohort interaction: Student Hispanic	0.047	0.085	0.584
Cohort interaction: Student FRPL	0.089	0.076	0.244
Cohort interaction: Student SPED	-0.037	0.070	0.601
Cohort interaction: Student LEP	-0.003	0.098	0.973
Cohort interaction: Student female	-0.085	0.045	0.059
Cohort interaction: Teacher black	-0.256	0.095	0.007

Exhibit D-4. Impact After Two Years of Mentoring – District A Both Cohorts Combined, Reading (concluded)

	Estimate	Standard Error	p-value
Cohort interaction: Teacher Bachelor's degree	-0.021	0.086	0.806
Cohort interaction: Teacher certification	0.131	0.093	0.160
Cohort interaction: Teacher female	0.042	0.247	0.864
Cohort interaction: School percent FRPL	-0.004	0.010	0.688
Cohort interaction: School rating	<0.001	0.076	0.999
Cohort interaction: School percent non-white	0.005	0.012	0.664
Cohort interaction: School percent student LEP	0.002	0.005	0.741
Cohort interaction: School percent SPED	0.004	0.016	0.815
Cohort interaction: District A block 1	-0.058	0.146	0.692
Cohort interaction: District A block 2	-0.340	0.149	0.023
Constant	-0.292	0.126	0.021
Random effects			
School	0.007		
Teacher	<0.001		
Student	0.307		
n			
Schools	35		
Teachers	55		
Students	2558		

Both Cohorts Combined, District B

Exhibit D-5. Impact After Two Years of Mentoring – District B Both Cohorts Combined, Math

	Estimate	Standard Error	p-value
Treatment indicator	0.188	0.068	0.006
Student variables			
Prior math score	0.706	0.012	<0.001
Grade 5	0.120	0.050	0.017
Grade 6	0.029	0.059	0.627
Grade 7	0.028	0.067	0.672
Grade 8	0.158	0.071	0.027
Student race is black CENTERED	-0.231	0.038	<0.001
Student Hispanic CENTERED	-0.106	0.030	<0.001
Student FRPL CENTERED	-0.132	0.035	<0.001
Student special education CENTERED	-0.187	0.031	<0.001
Student limited English CENTERED	-0.074	0.030	0.014
Student female CENTERED	0.007	0.019	0.699
Teacher variables			
Teacher black CENTERED	-0.010	0.115	0.932
Teacher Bachelor's degree CENTERED	0.096	0.062	0.123
Teacher partially certified CENTERED	0.344	0.179	0.055
Teacher female CENTERED	0.183	0.080	0.022
School variables			
School percent FRPL CENTERED	0.002	0.004	0.734
School Report Card Rating CENTERED	-0.011	0.029	0.718
School percent minority CENTERED	-0.002	0.006	0.734
School percent ELL CENTERED	-0.003	0.003	0.223
School percent IEP CENTERED	0.001	0.009	0.900
Blocking variables			
District B block 5	0.038	0.078	0.630
District B block 8	<0.001	0.103	0.999
Interactions with cohort			
Cohort indicator	0.006	0.137	0.962
Cohort interaction: Math pretest	0.035	0.024	0.135
Cohort interaction: Grade 5	-0.073	0.097	0.457
Cohort interaction: Grade 6	-0.003	0.111	0.977
Cohort interaction: Grade 8	0.585	0.134	<0.001
Cohort interaction: Student black	0.237	0.076	0.002
Cohort interaction: Student Hispanic	-0.074	0.059	0.212
Cohort interaction: Student FRPL	0.029	0.070	0.680
Cohort interaction: Student SPED	-0.056	0.063	0.370
Cohort interaction: Student LEP	0.135	0.060	0.025
Cohort interaction: Student female	0.007	0.037	0.856

Exhibit D-5. Impact After Two Years of Mentoring – District B Both Cohorts Combined, Math (concluded)

	Estimate	Standard Error	p-value
Cohort interaction: Teacher black	-0.097	0.231	0.673
Cohort interaction: Teacher Bachelor's degree	0.133	0.125	0.289
Cohort interaction: Teacher certification	0.218	0.354	0.538
Cohort interaction: Teacher female	0.102	0.155	0.509
Cohort interaction: School percent FRPL	-0.006	0.009	0.499
Cohort interaction: School rating	-0.085	0.054	0.115
Cohort interaction: School percent non-white	0.004	0.012	0.709
Cohort interaction: School percent student LEP	0.012	0.005	0.017
Cohort interaction: School percent SPED	-0.004	0.017	0.814
Cohort interaction: District B block 5	-0.098	0.146	0.502
Cohort interaction: District B block 8	-0.220	0.216	0.309
Constant	-0.146	0.077	0.060
Random effects			
School	0.025		
Teacher	0.018		
Student	0.253		
n			
Schools	55		
Teachers	81		
Student	3179		

Exhibit D-6. Impact After Two Years of Mentoring – District B Both Cohorts Combined, Reading

	Estimate	Standard Error	p-value
Treatment indicator	0.099	0.057	0.082
Student variables			
Prior reading score	0.707	0.012	<0.001
Grade 5	-0.032	0.036	0.381
Grade 6	0.027	0.037	0.465
Grade 7	-0.056	0.049	0.250
Grade 8	-0.034	0.048	0.486
Student race is black CENTERED	-0.112	0.037	0.002
Student Hispanic CENTERED	-0.006	0.030	0.833
Student FRPL CENTERED	-0.090	0.032	0.005
Student special education CENTERED	-0.293	0.027	<0.001
Student limited English CENTERED	-0.120	0.029	<0.001
Student female CENTERED	0.036	0.017	0.035
Teacher variables			
Teacher black CENTERED	0.121	0.072	0.091
Teacher Bachelor's degree CENTERED	-0.015	0.040	0.707
Teacher partially certified CENTERED	0.008	0.131	0.952
Teacher female CENTERED	0.073	0.053	0.167
School variables			
School percent FRPL CENTERED	-0.006	0.003	0.047
School Report Card Rating CENTERED	0.008	0.025	0.736
School percent minority CENTERED	0.007	0.004	0.109
School percent ELL CENTERED	-0.005	0.002	0.023
School percent IEP CENTERED	-0.002	0.007	0.760
Blocking variables			
District B block 5	-0.004	0.072	0.959
District B block 8	0.190	0.077	0.014
Interactions with cohort			
Cohort Indicator	0.191	0.088	0.030
Cohort interaction: Reading pretest	-0.065	0.024	0.008
Cohort interaction: Grade 5	-0.085	0.067	0.206
Cohort interaction: Grade 6	0.044	0.067	0.507
Cohort interaction: Grade 7	<0.001	<0.001	.
Cohort interaction: Grade 8	0.013	0.088	0.886
Cohort interaction: Student black	-0.063	0.073	0.389
Cohort interaction: Student Hispanic	0.040	0.060	0.505
Cohort interaction: Student FRPL	-0.042	0.063	0.508
Cohort interaction: Student SPED	-0.200	0.054	<0.001
Cohort interaction: Student LEP	0.078	0.059	0.181
Cohort interaction: Student female	0.016	0.034	0.645
Cohort interaction: Teacher black	0.606	0.145	<0.001

Exhibit D-6. Impact After Two Years of Mentoring – District B Both Cohorts Combined, Reading (concluded)

	Estimate	Standard Error	p-value
Cohort interaction: Teacher Bachelor's degree	0.055	0.087	0.529
Cohort interaction: Teacher certification	0.060	0.256	0.813
Cohort interaction: Teacher female	0.103	0.096	0.284
Cohort interaction: School percent FRPL	-0.007	0.006	0.232
Cohort interaction: School rating	-0.058	0.036	0.110
Cohort interaction: School percent non-white	-0.001	0.008	0.850
Cohort interaction: School percent student LEP	0.005	0.003	0.121
Cohort interaction: School percent SPED	-0.002	0.010	0.813
Cohort interaction: District B block 5	-0.138	0.105	0.191
Cohort interaction: District B block 8	-0.222	0.164	0.176
Constant	-0.020	0.057	0.724
Random effects			
School	0.030		
Teacher	<0.001		
Student	0.250		
n			
Schools	64		
Teachers	94		
Students	3589		

Cohort 1, Both Districts Combined

Exhibit D-7. Impact After Two Years of Mentoring – Cohort 1, Both Districts Combined, Math

	Estimate	Standard Error	p-value
Treatment indicator	0.158	0.067	0.019
Student variables			
Prior math score	0.688	0.015	<0.001
Grade 5	0.154	0.045	0.001
Grade 6	0.036	0.059	0.543
Grade 7	0.047	0.070	0.502
Grade 8	-0.123	0.072	0.085
Student race is black CENTERED	-0.351	0.057	<0.001
Student Hispanic CENTERED	-0.068	0.044	0.122
Student FRPL CENTERED	-0.145	0.053	0.007
Student special education CENTERED	-0.161	0.035	<0.001
Student limited English CENTERED	-0.141	0.036	<0.001
Student female CENTERED	0.004	0.025	0.884
Teacher variables			
Teacher black CENTERED	0.060	0.123	0.627
Teacher Bachelor's degree CENTERED	0.032	0.074	0.661
Teacher partially certified CENTERED	0.254	0.149	0.088
Teacher female CENTERED	0.128	0.103	0.211
School variables			
School percent FRPL CENTERED	0.004	0.005	0.478
School Report Card Rating CENTERED	0.039	0.032	0.224
School percent minority CENTERED	-0.003	0.007	0.654
School percent ELL CENTERED	-0.009	0.003	0.012
School percent IEP CENTERED	0.003	0.008	0.696
Blocking variables			
District B block 5	0.082	0.101	0.416
District B block 8	0.090	0.129	0.484
District A block 1	0.081	0.196	0.681
District A block 2	0.022	0.218	0.920
Interactions with district			
District Indicator	0.037	0.253	0.885
District interaction: Math pretest	-0.185	0.027	<0.001
District interaction: Grade 5	-0.067	0.187	0.723
District interaction: Grade 6	-0.069	0.194	0.722
District interaction: Grade 7	-0.012	0.228	0.956
District interaction: Grade 8	-0.003	0.234	0.991

Exhibit D-7. Impact After Two Years of Mentoring – Cohort 1, Both Districts Combined, Math (concluded)

	Estimate	Standard Error	p-value
District interaction: Student black	0.162	0.073	0.027
District interaction: Student Hispanic	-0.038	0.068	0.578
District interaction: Student FRPL	0.001	0.073	0.986
District interaction: Student SPED	-0.060	0.066	0.365
District interaction: Student LEP	0.240	0.086	0.005
District interaction: Student female	-0.048	0.042	0.254
District interaction: Teacher black	0.049	0.216	0.820
District interaction: Teacher Bachelor's degree	-0.016	0.192	0.932
District interaction: Teacher certification	-0.513	0.198	0.009
District interaction: Teacher female	-0.111	0.148	0.453
District interaction: School percent FRPL	-0.016	0.008	0.040
District interaction: School rating	0.034	0.094	0.718
District interaction: School percent non-white	0.018	0.014	0.201
District interaction: School percent student LEP	0.006	0.008	0.463
District interaction: School percent SPED	-0.021	0.029	0.472
Constant	-0.118	0.089	0.185
Random effects			
School	0.023		
Teacher	0.015		
Student	0.262		
n			
Schools	52		
Teachers	76		
Students	2806		

Exhibit D-8. Impact After Two Years of Mentoring – Cohort 1, Both Districts Combined, Reading

	Estimate	Standard Error	p-value
Treatment indicator	0.111	0.061	0.070
Student variables			
Prior reading score	0.737	0.017	<0.001
Grade 5	-0.007	0.042	0.863
Grade 6	-0.036	0.047	0.448
Grade 7	-0.151	0.063	0.017
Grade 8	-0.068	0.054	0.208
Student race is black CENTERED	-0.073	0.055	0.188
Student Hispanic - CENTERED	-0.021	0.049	0.663
Student FRPL CENTERED	-0.069	0.055	0.207
Student special education CENTERED	-0.196	0.038	<0.001
Student limited English CENTERED	-0.163	0.039	<0.001
Student female CENTERED	0.029	0.024	0.235
Teacher variables			
Teacher black CENTERED	-0.073	0.089	0.409
Teacher Bachelor's degree CENTERED	-0.036	0.052	0.487
Teacher partially certified CENTERED	0.017	0.086	0.846
Teacher female CENTERED	0.052	0.078	0.503
School variables			
School percent FRPL CENTERED	-0.004	0.005	0.412
School Report Card Rating CENTERED	0.035	0.030	0.242
School percent minority CENTERED	0.007	0.007	0.288
School percent ELL CENTERED	-0.006	0.003	0.053
School percent IEP CENTERED	<0.001	0.007	0.952
Blocking variables			
District B block 5	0.065	0.094	0.489
District B block 8	0.283	0.106	0.007
District A block 1	0.255	0.163	0.117
District A block 2	0.175	0.173	0.310
Interactions with district			
District indicator	-0.032	0.021	0.126
District interaction: Reading pretest	-0.031	0.026	0.240
District interaction: Grade 5	-0.006	0.177	0.975
District interaction: Grade 6	-0.260	0.176	0.138
District interaction: Grade 7	0.101	0.191	0.596
District interaction: Grade 8	-0.059	0.196	0.763
District interaction: Student black	-0.057	0.081	0.482
District interaction: Student Hispanic	-0.076	0.081	0.347
District interaction: Student FRPL	-0.035	0.077	0.650
District interaction: Student SPED	-0.064	0.066	0.336

Exhibit D-8. Impact After Two Years of Mentoring – Cohort 1, Both Districts Combined, Reading (concluded)

	Estimate	Standard Error	p-value
District interaction: Student LEP	0.005	0.090	0.959
District interaction: Student female	0.078	0.040	0.053
District interaction: Teacher black	0.282	0.126	0.025
District interaction: Teacher partially certified	0.029	0.082	0.722
District interaction: Teacher female	-0.159	0.119	0.181
District interaction: School percent FRPL	-0.050	0.134	0.712
District interaction: School rating	-0.002	0.007	0.839
District interaction: School percent non-white	-0.041	0.080	0.611
District interaction: School percent student LEP	-0.007	0.010	0.509
District interaction: School percent SPED	0.013	0.007	0.050
Constant	-0.086	0.071	0.225
Random effect			
School	0.030		
Teacher	<0.001		
Student	0.283		
n			
Schools	59		
Teachers	86		
Students	3190		

Cohort 1, District A

Exhibit D-9. Impact After Two Years of Mentoring – District A Cohort 1, Math

	Estimate	Standard Error	p-value
Treatment indicator	-0.119	0.063	0.058
Student variables			
Prior math score	0.512	0.020	<0.001
Student in 5th grade	0.094	0.149	0.530
Student in 6th grade	0.034	0.142	0.810
Student in 7th grade	0.323	0.167	0.053
Student in 8th grade	0.001	0.161	0.994
Student race is black CENTERED	-0.131	0.033	<0.001
Student FRPL CENTERED	-0.168	0.045	<0.001
Student special education CENTERED	-0.227	0.051	<0.001
Student limited English CENTERED	0.065	0.070	0.349
Student female CENTERED	-0.045	0.031	0.147
Teacher variables			
Teacher black CENTERED	0.267	0.092	0.004
Teacher Bachelor's degree CENTERED	0.153	0.094	0.103
Teacher partially certified CENTERED	-0.026	0.080	0.745
Teacher female CENTERED	0.014	0.042	0.742
Teacher variables			
School percent FRPL CENTERED	-0.012	0.002	<0.001
School Report Card Rating CENTERED	0.030	0.037	0.414
School percent minority CENTERED	<0.001	0.006	0.983
School percent ELL CENTERED	0.007	0.004	0.061
School percent IEP CENTERED	-0.024	0.013	0.070
Blocking variables			
District A block 1	-0.116	0.095	0.221
District A block 2	-0.157	0.099	0.111
Constant	0.038	0.165	0.819
Random effects			
School	<0.001		
Teacher	<0.001		
Student	0.223		
n			
Schools	19		
Teachers	27		
Students	982		

Exhibit D-10. Impact After Two Years of Mentoring – District A Cohort 1, Reading

	Estimate	Standard Error	p-value
Treatment indicator	0.079	0.086	0.360
Student variables			
Prior reading score	0.710	0.021	<0.001
Student in 5th grade	-0.025	0.172	0.884
Student in 6th grade	-0.270	0.167	0.105
Student in 7th grade	-0.024	0.175	0.890
Student in 8th grade	-0.109	0.185	0.556
Student race is black CENTERED	-0.059	0.043	0.167
Student FRPL CENTERED	-0.118	0.056	0.034
Student special education CENTERED	-0.262	0.056	<0.001
Student limited English CENTERED	-0.166	0.084	0.048
Student female CENTERED	0.104	0.034	0.002
Teacher variables			
Teacher black CENTERED	0.215	0.083	0.010
Teacher Bachelor's degree CENTERED	-0.014	0.064	0.822
Teacher partially certified CENTERED	-0.124	0.074	0.093
Teacher female CENTERED	0.039	0.091	0.671
School variables			
School percent FRPL CENTERED	-0.006	0.004	0.150
School Report Card Rating CENTERED	0.005	0.057	0.923
School percent minority CENTERED	<0.001	0.006	0.992
School percent ELL CENTERED	0.009	0.005	0.058
School percent IEP CENTERED	-0.031	0.016	0.043
Blocking variables			
District A block 1	0.242	0.131	0.065
District A block 2	0.188	0.133	0.159
Constant	-0.049	0.211	0.816
Random effects			
School	0.011		
Teacher	<0.001		
Student	0.305		
n			
Schools	23		
Teachers	32		
Students	1148		

Cohort 1, District B

Exhibit D-11. Impact After Two Years of Mentoring – District B Cohort 1, Math

	Estimate	Standard Error	p-value
Treatment indicator	0.227	0.096	0.017
Student variables			
Prior math score	0.688	0.016	<0.001
Student in 5th grade	0.162	0.047	0.001
Student in 6th grade	0.037	0.062	0.551
Student in 7th grade	0.041	0.075	0.580
Student in 8th grade	-0.128	0.076	0.091
Student race is black CENTERED	-0.303	0.050	<0.001
Student FRPL CENTERED	-0.161	0.054	0.003
Student special education CENTERED	-0.160	0.036	<0.001
Student limited English CENTERED	-0.145	0.038	<0.001
Student female CENTERED	0.004	0.026	0.885
Teacher variables			
Teacher black CENTERED	0.060	0.136	0.658
Teacher Bachelor's degree CENTERED	0.048	0.081	0.558
Teacher partially certified CENTERED	0.269	0.162	0.096
Teacher female CENTERED	0.120	0.114	0.295
School variables			
School percent FRPL CENTERED	0.005	0.007	0.462
School Report Card Rating CENTERED	0.047	0.039	0.221
School percent minority CENTERED	-0.004	0.009	0.624
School percent ELL CENTERED	-0.010	0.004	0.016
School percent IEP CENTERED	0.004	0.010	0.702
Blocking variables			
District B block 5	0.079	0.124	0.523
District B block 8	0.092	0.153	0.547
Constant	-0.147	0.106	0.163
Random effects			
School	0.042		
Teacher	0.017		
Student	0.284		
n			
Schools	33		
Teachers	49		
Students	1824		

Exhibit D-12. Impact After Two Years of Mentoring – District B Cohort 1, Reading

	Estimate	Standard Error	p-value
Treatment indicator	0.131	0.092	0.152
Student variables			
Prior reading score	0.735	0.017	<0.001
Student in 5th grade	-0.017	0.042	0.690
Student in 6th grade	-0.049	0.048	0.303
Student in 7th grade	-0.176	0.064	0.006
Student in 8th grade	-0.073	0.053	0.170
Student race is black CENTERED	-0.053	0.045	0.236
Student FRPL CENTERED	-0.074	0.052	0.158
Student special education CENTERED	-0.199	0.037	<0.001
Student limited English CENTERED	-0.167	0.038	<0.001
Student female CENTERED	0.030	0.024	0.207
Teacher variables			
Teacher black CENTERED	-0.088	0.094	0.345
Teacher Bachelor's degree CENTERED	-0.025	0.052	0.628
Teacher partially certified CENTERED	-0.006	0.086	0.946
Teacher female CENTERED	0.054	0.083	0.515
School variables			
School percent FRPL CENTERED	-0.004	0.006	0.472
School Report Card Rating CENTERED	0.036	0.036	0.312
School percent minority CENTERED	0.008	0.008	0.363
School percent ELL CENTERED	-0.006	0.003	0.086
School percent IEP CENTERED	0.001	0.008	0.922
Blocking variables			
District B block 5	0.063	0.113	0.578
District B block 8	0.307	0.124	0.014
Constant	-0.096	0.083	0.247
Random effects			
School	0.047		
Teacher	<0.001		
Student	0.27		
n			
Schools	36		
Teachers	54		
Students	2042		

Cohort 2, Both Districts Combined

Exhibit D-13. Impact After Two Years of Mentoring – Cohort 2, Both Districts Combined, Math

	Estimate	Standard Error	p-value
Treatment indicator	0.071	0.074	0.335
Student variables			
Prior math score	0.724	0.016	<0.001
Grade 5	0.061	0.071	0.393
Grade 6	-0.013	0.083	0.872
Grade 7	-0.119	0.190	0.531
Grade 8	0.332	0.097	0.001
Student race is black CENTERED	-0.117	0.045	0.010
Student Hispanic - CENTERED	-0.148	0.036	<0.001
Student FRPL CENTERED	-0.116	0.041	0.005
Student special education CENTERED	-0.209	0.045	<0.001
Student limited English CENTERED	-0.008	0.043	0.845
Student female CENTERED	0.013	0.025	0.605
Teacher variables			
Teacher black CENTERED	-0.090	0.118	0.443
Teacher Bachelor's degree CENTERED	0.103	0.073	0.156
Teacher partially certified CENTERED	0.274	0.209	0.189
Teacher female CENTERED	0.179	0.076	0.018
School variables			
School percent FRPL CENTERED	-0.001	0.004	0.781
School Report Card Rating CENTERED	-0.060	0.029	0.039
School percent minority CENTERED	-0.002	0.006	0.786
School percent ELL CENTERED	0.002	0.002	0.421
School percent IEP CENTERED	0.003	0.012	0.824
Blocking variables			
District B block 5	0.055	0.076	0.469
District B block 8	-0.081	0.106	0.444
District A block 1	0.640	0.144	<0.001
District A block 2	0.096	0.153	0.530
Interactions with district			
District indicator	-0.635	0.205	0.002
District interaction: Math pretest	-0.124	0.026	<0.001
District interaction: Grade 5	0.821	0.159	<0.001
District interaction: Grade 6	0.532	0.204	0.009
District interaction: Grade 7	1.058	0.274	<0.001
District interaction: Grade 8	0.437	0.223	0.050

Exhibit D-13. Impact After Two Years of Mentoring – Cohort 2, Both Districts Combined, Math (concluded)

	Estimate	Standard Error	p-value
District interaction: Student black	0.018	0.072	0.801
District interaction: Student Hispanic	0.147	0.068	0.031
District interaction: Student FRPL	0.123	0.066	0.063
District interaction: Student SPED	0.098	0.066	0.136
District interaction: Student LEP	-0.208	0.085	0.015
District interaction: Student female	-0.022	0.041	0.590
District interaction: Teacher black	-0.511	0.164	0.002
District interaction: Teacher Bachelor's degree	-1.023	0.130	<0.001
District interaction: Teacher certification	-0.031	0.229	0.893
District interaction: Teacher female	0.220	0.159	0.165
District interaction: School percent FRPL	0.020	0.011	0.062
District interaction: School rating	0.326	0.090	<0.001
District interaction: School percent non-white	-0.003	0.012	0.789
District interaction: School percent student LEP	0.015	0.005	0.004
District interaction: School percent SPED	-0.037	0.016	0.023
Constant	-0.069	0.089	0.439
Random effect			
School	<0.001		
Teacher	0.011		
Student	0.203	0.006	0
n			
Schools	47		
Teachers	53		
Students	2166		

Exhibit D-14. Impact After Two Years of Mentoring – Cohort 2, Both Districts Combined, Reading

	Estimate	Standard Error	p-value
Treatment indicator	0.004	0.043	0.923
Student variables			
Prior reading score	0.685	0.019	<0.001
Grade 5	0.096	0.057	0.090
Grade 6	0.142	0.063	0.024
Grade 7	0.108	0.074	0.145
Grade 8	0.141	0.087	0.105
Student race is black CENTERED	-0.124	0.052	0.017
Student Hispanic - CENTERED	0.012	0.038	0.754
Student FRPL CENTERED	-0.107	0.038	0.005
Student special education CENTERED	-0.378	0.040	<0.001
Student limited English CENTERED	-0.073	0.046	0.117
Student female CENTERED	0.048	0.027	0.074
Teacher variables			
Teacher black CENTERED	0.398	0.081	<0.001
Teacher Bachelor's degree CENTERED	-0.054	0.052	0.296
Teacher partially certified CENTERED	-0.049	0.170	0.771
Teacher female CENTERED	0.112	0.054	0.037
School variables			
School percent FRPL CENTERED	-0.009	0.002	<0.001
School Report Card Rating CENTERED	-0.017	0.024	0.469
School percent minority CENTERED	0.007	0.003	0.005
School percent ELL CENTERED	-0.002	0.002	0.114
School percent IEP CENTERED	0.011	0.007	0.120
Blocking variables			
District B block 5	-0.064	0.065	0.324
District B block 8	0.053	0.084	0.529
District A block 1	0.145	0.083	0.081
District A block 2	-0.136	0.090	0.131
Interactions with district			
District indicator	-0.608	0.151	<0.001
District interaction: Reading pretest	-0.030	0.025	0.240
District interaction: Grade 5	0.597	0.116	<0.001
District interaction: Grade 6	0.499	0.128	<0.001
District interaction: Grade 7	0.746	0.143	<0.001
District interaction: Grade 8	0.577	0.170	0.001
District interaction: Student black	-0.002	0.071	0.980
District interaction: Student Hispanic	-0.067	0.063	0.287
District interaction: Student FRPL	0.082	0.061	0.178

Exhibit D-14. Impact After Two Years of Mentoring – Cohort 2, Both Districts Combined, Reading (concluded)

	Estimate	Standard Error	p-value
District interaction: Student SPED	0.086	0.056	0.125
District interaction: Student LEP	-0.082	0.066	0.217
District interaction: Student female	-0.029	0.039	0.451
District interaction: Teacher black	-0.487	0.101	<0.001
District interaction: Teacher Bachelor's degree	0.025	0.079	0.748
District interaction: Teacher certification	0.059	0.181	0.746
District interaction: Teacher female	-0.012	0.209	0.954
District interaction: School percent FRPL	0.001	0.008	0.885
District interaction: School rating	0.034	0.063	0.584
District interaction: School percent non-white	-0.004	0.010	0.662
District interaction: School percent student LEP	0.014	0.003	<0.001
District interaction: School percent SPED	-0.033	0.012	0.007
Constant	0.026	0.068	0.703
Random effects			
School	<0.001		
Teacher	0.004		
Student	0.263		
n			
Schools	54		
Teachers	63		
Students	2957		

Cohort 2, District A

Exhibit D-14. Impact After Two Years of Mentoring – District A Cohort 2, Math

	Estimate	Standard Error	p-value
Treatment indicator	0.200	0.136	0.142
Student variables			
Prior math score	0.600	0.020	<0.001
Student in 5th grade	0.898	0.138	<0.001
Student in 6th grade	0.590	0.193	0.002
Student in 7th grade	0.953	0.201	<0.001
Student in 8th grade	0.766	0.190	<0.001
Student race is black CENTERED	-0.098	0.041	0.016
Student FRPL CENTERED	0.006	0.049	0.904
Student special education CENTERED	-0.111	0.046	0.015
Student limited English CENTERED	-0.221	0.071	0.002
Student female CENTERED	-0.007	0.032	0.818
Teacher variables			
Teacher black CENTERED	-0.615	0.099	<0.001
Teacher Bachelor's degree CENTERED	-0.896	0.095	<0.001
Teacher partially certified CENTERED	0.315	0.104	0.002
Teacher female CENTERED	0.478	0.146	0.001
School variables			
School percent FRPL CENTERED	0.022	0.010	0.020
School Report Card Rating CENTERED	0.293	0.076	<0.001
School percent minority CENTERED	-0.007	0.010	0.473
School percent ELL CENTERED	0.017	0.004	<0.001
School percent IEP CENTERED	-0.043	0.014	0.002
Blocking variables			
District A block 1	0.640	0.124	<0.001
District A block 2	0.013	0.151	0.932
Constant	-0.809	0.220	<0.001
Random effect			
School	<0.001		
Teacher	0.007		
Student	0.189		
n			
Schools	18		
Teachers	21		
Students	811		

Exhibit D-15. Impact After Two Years of Mentoring – District A Cohort 2, Reading

	Estimate	Standard Error	p-value
Treatment indicator	-0.015	0.069	0.826
Student variables			
Prior reading score	0.657	0.019	<0.001
Student in 5th grade	0.653	0.108	<0.001
Student in 6th grade	0.563	0.120	<0.001
Student in 7th grade	0.804	0.119	<0.001
Student in 8th grade	0.704	0.154	<0.001
Student race is black CENTERED	-0.097	0.038	0.011
Student FRPL CENTERED	-0.035	0.051	0.491
Student special education CENTERED	-0.291	0.042	<0.001
Student limited English CENTERED	-0.146	0.051	0.004
Student female CENTERED	0.017	0.030	0.568
Teacher variables			
Teacher black CENTERED	-0.080	0.045	0.078
Teacher Bachelor's degree CENTERED	-0.036	0.049	0.461
Teacher partially certified CENTERED	0.020	0.046	0.659
Teacher female CENTERED	0.166	0.177	0.347
School variables			
School percent FRPL CENTERED	-0.006	0.007	0.344
School Report Card Rating CENTERED	0.025	0.052	0.636
School percent minority CENTERED	0.001	0.007	0.880
School percent ELL CENTERED	0.011	0.002	<0.001
School percent IEP CENTERED	-0.024	0.008	0.004
Blocking variables			
District A block 1	0.156	0.070	0.026
District A block 2	-0.165	0.073	0.024
Constant	-0.538	0.135	<0.001
Random effect			
School	<0.001		
Teacher	<0.001		
Student	0.309		
n			
Schools	18		
Teachers	23		
Students	1410		

Cohort 2, District B

Exhibit D-16. Impact After Two Years of Mentoring – District B Cohort 2, Math

	Estimate	Standard Error	p-value
Treatment indicator	0.045	0.093	0.629
Student variables			
Prior math score	0.732	0.017	<0.001
Student in 5th grade	0.084	0.078	0.278
Student in 6th grade	0.006	0.090	0.944
Student in 7th grade	-0.128	0.200	0.523
Student in 8th grade	0.390	0.106	<0.001
Student race is black CENTERED	-0.017	0.039	0.661
Student FRPL CENTERED	-0.144	0.042	0.001
Student special education CENTERED	-0.213	0.047	<0.001
Student limited English CENTERED	-0.002	0.044	0.961
Student female CENTERED	0.014	0.026	0.593
Teacher variables			
Teacher black CENTERED	-0.088	0.134	0.513
Teacher Bachelor's degree CENTERED	0.089	0.083	0.284
Teacher partially certified CENTERED	0.289	0.233	0.215
Teacher female CENTERED	0.178	0.087	0.041
School variables			
School percent FRPL CENTERED	-0.002	0.005	0.690
School Report Card Rating CENTERED	-0.057	0.034	0.089
School percent minority CENTERED	-0.001	0.006	0.884
School percent ELL CENTERED	0.003	0.003	0.361
School percent IEP CENTERED	0.007	0.014	0.608
Blocking variables			
District B block 5	0.025	0.087	0.773
District B block 8	-0.119	0.121	0.325
Constant	-0.069	0.101	0.496
Random effects			
School	<0.001		
Teacher	0.016		
Student	0.214		
n			
Schools	29		
Teachers	32		
Students	1355		

Exhibit D-17. Impact After Two Years of Mentoring – District B Cohort 2, Reading

	Estimate	Standard Error	p-value
Treatment indicator	0.033	0.056	0.559
Student variables			
Prior reading score	0.678	0.017	<0.001
Student in 5th grade	0.087	0.058	0.133
Student in 6th grade	0.139	0.059	0.019
Student in 7th grade	0.124	0.072	0.087
Student in 8th grade	0.137	0.083	0.101
Student race is black CENTERED	-0.142	0.043	0.001
Student FRPL CENTERED	-0.108	0.034	0.001
Student special education CENTERED	-0.383	0.038	<0.001
Student limited English CENTERED	-0.074	0.043	0.087
Student female CENTERED	0.046	0.024	0.057
Teacher variables			
Teacher black CENTERED	0.418	0.094	<0.001
Teacher Bachelor's degree CENTERED	-0.049	0.057	0.386
Teacher partially certified CENTERED	-0.039	0.178	0.825
Teacher female CENTERED	0.130	0.058	0.025
School variables			
School percent FRPL CENTERED	-0.009	0.002	<0.001
School Report Card Rating CENTERED	-0.023	0.027	0.398
School percent minority CENTERED	0.007	0.003	0.015
School percent ELL CENTERED	-0.003	0.002	0.132
School percent IEP CENTERED	0.006	0.008	0.483
Blocking variables			
District B block 5	-0.076	0.071	0.284
District B block 8	0.040	0.093	0.665
Constant	0.015	0.072	0.830
Random effects			
School	0.007		
Teacher	0.001		
Student	0.221		
n			
Schools	36		
Teachers	40		
Students	1547		

Appendix E. Sensitivity Tests

Following the student achievement analyses, we carried out several tests of the sensitivity of our results to different specifications of the model. The first of these tests (late joiners) was reported in the student achievement section of Appendix A. This section is designed to address four additional questions:

1. Is the estimated impact of the NTC model on student achievement different for elementary school students than for middle school students?
2. Is the relationship between the NTC induction model and student achievement affected by students taking mathematics or ELA classes with more than one study teacher?
3. Does the relationship between the NTC induction model and student achievement vary by school characteristics?
4. Are measures of the frequency, duration, or quality of the mentoring experience associated with higher student achievement?

These analyses used multi-level regressions of the same structure as the achievement analysis reported in Appendix A, with students nested within teachers nested within schools, controls for student variables, teacher variables, school variables, and blocking variables, and interactions with cohort and district indicators.

Is the estimated impact of the NTC model on student achievement different for elementary school students than for middle school students?

The student achievement impact estimates combined students in grades 4 through 8, with controls for grade level included in the models. However, previous studies have found that achievement gains often vary substantially by grade level (e.g., Lipsey, et. al, 2012).[15] Therefore, we examined the impact of the NTC model on student achievement for elementary and middle school grades separately and tested whether the impact varied.[16]

The overall impact of the NTC induction model after 2 years of support in ELA was statistically significant in elementary school, but not in middle school. However, the difference in the size of these impacts was not statistically significant. The overall impact in mathematics was statistically significant in both middle school and elementary school, and the difference in impact by grade level was not statistically significant (Exhibit E-1). This result indicates that the impact of the NTC model on student achievement does not vary significantly by school level.

[15] Lipsey, M. W., Puzio, K., Yun, C., Hebert, M. A., Steinka-Fry, K., Cole, M. W., Roberts, M., Anthony, K. S., & Busick, M.D. (2012). *Translating the Statistical Representation of the Effects of Education Interventions into More Readily Interpretable Forms*. (NCSER 2013–3000). Washington, DC: National Center for Special Education Research, Institute of Education Sciences (IES), U.S. Department of Education. This report is available on the IES website, http://ies.ed.gov/ncser/

[16] The sample sizes at each grade level were too small to examine impact estimates for each grade separately.

Exhibit E-1. Estimates of the Impact of NTC on Student Achievement Overall, by School Level, Two Years of Induction Support

		Treatment	Control	Impact	N schools	N teachers	N students
ELA	Elementary	0.07	-0.03	0.10*	69	94	2,691
	Middle school	0.04	-0.03	0.08	59	78	3,456
	Difference in impacts			0.02	99	149	6,147
Mathematics	Elementary	0.03	-0.12	0.15*	60	86	2,258
	Middle school	0.15	0.01	0.14*	45	59	2,714
	Difference in impacts			0.01	86	129	4,972

$^{+}p < 0.10$ * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Is the relationship between the NTC induction model and student achievement affected by students taking mathematics or ELA classes with more than one study teacher?

Some students in both BCPS and CPS took more than one mathematics or ELA class in the same year, usually with two or more different teachers. If these students appeared in the classroom for more than one study teacher, they were included in the estimation for both teachers. However, this approach double-counted some students. In the mathematics analysis, 462 students appeared in more than one teacher's classroom. In the ELA analysis, 1,716 students appeared in more than one teacher's classroom. In this analysis we tested whether excluding these duplicate students affects the results.

Excluding duplicate students slightly decreased the size of the estimates of the impact of the NTC model after 2 years of mentoring in mathematics and ELA (Exhibit E-2). The impact of the NTC model on mathematics achievement remained positive and statistically significant when duplicate students were excluded, with a slight decrease in the estimate (from 0.15 to 0.11 standard deviation). The impact of the NTC model on ELA achievement was reduced by only 0.01 SD, but the resulting coefficient was not statistically significant. This sensitivity analyses drastically reduced the sample (from 6,147 students to 4,431 students), which affected our power to detect an impact.

Exhibit E-2. Estimates of the Impact of the NTC on Student Achievement Overall, Excluding Duplicate Students, Two Years of Induction Support

		Impact	N schools	N teachers	N students
ELA	Original estimate	0.09*	99	149	6,147
	Excluding duplicate students	0.08	87	127	4,431
Mathematics	Original estimate	0.15**	86	129	4,972
	Excluding duplicate students	0.11*	86	125	4,510

* $p < 0.05$

Does the relationship between the NTC induction model and student achievement vary by school characteristics?

After 2 years of mentoring, there were positive impacts in both reading and mathematics. However, these main effects may mask a variation in the impact of the model depending on school characteristics. For example, the NTC model may have a stronger impact in schools with a greater proportion of minority students. Therefore, we tested interactions between school characteristics and student achievement outcomes.

The overall impact of NTC induction on student achievement after 2 years of induction support did not significantly vary by:

- School report card rating
- Percent English learners
- Percent free or reduced-price lunch (FRPL)
- Percent minority
- Percent individualized education program (special education)

However, the impact of the NTC induction model on student achievement after 2 years of induction support did vary by school characteristics in District A. In schools with an above-average proportion of students receiving FRPL,[17] the impact of NTC on student achievement in mathematics was not statistically significant. However, in schools with a *below*-average proportion of students receiving FRPL, the impact was statistically significant and negative. The difference between the impact in the two types of schools was statistically significant. (Exhibit E-3).

Conversely, in schools in District A with a below-average proportion of students with individualized education programs (IEPs), the impact of NTC on student achievement in mathematics was not statistically significant. However, in schools with an *above*-average proportion of students with IEPs, the impact was statistically significant and negative. The difference between the impact in the two types of schools was statistically significant (Exhibit E-3). We conducted similar analyses for District B but there were no statistically significant results.

[17] District averages at the time of randomization were used.

Exhibit E-3. Estimates of the Impact of NTC on Student Achievement in District A, by School Demographics, Two Years of Induction Support

		Treatment	Control	Impact	N schools	N teachers	N students
Percent FRPL	Above average	-0.41	-0.42	0.01	22	36	1,358
	Below average	-0.13	0.24	-0.38*	9	12	435
	Difference in impacts			**0.39***	31	48	1,793
Percent IEP	Above average	-0.39	-0.05	-0.34*	13	17	486
	Below average	-0.19	-0.26	0.07	18	31	1,307
	Difference in impacts			**-0.41***	31	48	1,793

$^{+}p < 0.10$ * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Are measures of the frequency, duration, or quality of the mentoring experience associated with higher student achievement?

The estimates of the impact of the NTC model on student achievement compared the entire treatment group to the control group. However, implementation of the NTC model varied by treatment teacher, and some aspects of the model were also experienced by control teachers. Therefore, we used teacher survey and Learning Zone data to examine correlations between frequency, duration, and quality of mentoring and student achievement. Because teachers were not randomly assigned to different levels of mentoring, this analysis is **strictly correlational** and cannot be used to infer a causal relationship between these aspects of mentoring and student achievement.

Survey measures were available on both treatment and control teachers, but were self-reported:

- Presence of a mentor (Yes/No)
- Frequency of meeting with a mentor (At least weekly vs. Less than weekly)
- Duration of meetings with mentor (An hour or more vs. Less than an hour)
- Frequency of high-leverage mentoring activities[18] (Continuous)
- Value of mentoring activities to the teacher[19] (Continuous)

Learning Zone measures were available only for treatment teachers:

- Average number of minutes of mentoring per month (Continuous)
- Percent of in-person mentoring sessions where a Formative Assessment and Support System (FAS) tool was used (Continuous)

[18] The items that make up this scale are listed in Appendix G.
[19] The items that make up this scale are listed in Appendix G.

All teachers (both treatment and control) who had students in the achievement analysis also reported having a mentor. With no variation, we could not test the relationship between having a mentor and teachers' student achievement.

There was a significant positive relationship between student mathematics achievement and (1) the self-reported frequency of teachers' meetings with mentors, (2) the self-reported length of mentoring meetings, and (3) the self-reported frequency of high-leverage mentoring activities. Teachers who reported meeting at least weekly with their mentors had students with mathematics scores 0.13 standard deviation higher than those who met with their mentors less often ($p < 0.01$). Teachers who reported meeting with their mentors for an hour or more had students with mathematics test scores 0.14 standard deviation higher than those who met with their mentors for a shorter time period. Finally, an increase of one standard deviation in high-leverage mentoring activities was associated with an increase of 0.11 standard deviation in mathematics achievement (Exhibit E-4).

In reading/ELA, there was a statistically significant positive association between student achievement and the length of mentoring meetings. Teachers who reported meeting with their mentors for an hour or more had students with reading/ELA test scores 0.17 standard deviation higher than those who met with their mentors for a shorter time period. There was no statistically significant relationship between student achievement in reading/ELA and the frequency of mentoring meetings or the frequency of high leverage mentoring activities (Exhibit E-4).

There was no statistically significant relationship detected between student achievement in either reading/ELA or mathematics and:

- Value of mentoring activities to the teacher
- Learning Zone measures of meeting length (within treatment only)
- Percent of in-person mentoring sessions where a Formative Assessment and Support System (FAS) tool was used (within treatment only)

Exhibit E-4. Estimates of the Relationship Between Survey Responses and Student Achievement, Cohort 1 Year 2 (2014–15) and Cohort 2 Year 2 (2015–16)

		Mathematics	Reading
Frequency of meetings (treatment and control combined)	Less than weekly	-0.13	0.03
	At least weekly	0.00	0.06
	Difference	**0.13***	0.03
	N schools	*64*	*72*
	N teachers	*89*	*97*
	N students	*3,592*	*4,255*
Length of meetings (treatment and control combined)	Less than one hour	-0.15	-0.09
	An hour or more	-0.01	0.08
	Difference	**0.14***	**0.17***
	N schools	*62*	*68*
	N teachers	*84*	*91*
	N students	*3,380*	*4,050*
Frequency of high-leverage mentoring activities (treatment and control combined)	Average frequency of activities	-0.23	0.00
	One SD above average	-0.12	0.02
	Difference	**0.11***	0.02
	N schools	*63*	*71*
	N teachers	*87*	*96*
	N students	*3,538*	*4,206*

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Exhibit F-1 provides the definition and metric for each element under each key component included for implementation fidelity.

Exhibit F-1: Implementation Fidelity Tables

	Key Elements of Component	Operational Definition for Indicator	Data Source(s) for Measuring Indicator	Implementation Score
Component 1. New Teacher Center Supports Decision rules for rolling up to the component level for each study site: • High fidelity if greater than 60% of individual indicators are scored as high (3) and less than or equal to 20% of indicators are scored as low (1). • Medium fidelity if individual indicator scores do not reach the threshold for high fidelity (3) and less than 50% of indicators are scored as low (1). • Low fidelity if greater than or equal to 50% of indicators are scored as low (1).				
1.1a	Implementation support by site leads—developing and advocating for full-time mentoring model.	Whether site lead provides support for implementation at the study site by advocating for and developing understanding of a full-time mentoring model.	Interviews with district staff	3 = present (based on interview data identifying at least one activity with this indicator as the goal) 1 = absent
1.1b	Implementation support by NTC leads— engaging principals.	Whether NTC lead provides support for implementation at the study site by conducting a half-day "role of the principal" training session for principals in schools receiving NTC services.	Attendance records from NTC	3 = 80%+ of principals in their first year at an NTC-served school participated in a half-day training session; 2 = 60–79% of principals in their first year at an NTC-served school participated in a half-day training session; 1 = Less than 60% of principals in their first year at an NTC-served school participated in a half-day training session
1c	Implementation support by site leads— engaging principals.	Whether site lead provides support for implementation at the study site by engaging principals through annual 1:1 meetings.	Attendance records from NTC	3 = 80%+ of principals met 1:1 with site lead at least once during the academic year; 2 = 60–79% of principals met 1:1 with site lead at least once during the academic year; 1 = Less than 60% of principals met 1:1 with site lead at least once during the academic year.

Exhibit F-1: Implementation Fidelity Tables (continued)

	Key Elements of Component	Operational Definition for Indicator	Data Source(s) for Measuring Indicator	Implementation Score
1.2	Capacity building by site leads.	Whether site lead builds sustainability for district-led mentor program after NTC involvement by attending NTIN to conduct goal-setting along with 2 additional LEA staff in year 2; attending presenters' academy along with those same LEA staff in year 2; leading all mentor forums in year 2; and co-presenting all mentor academies in year 3.	Attendance records from NTC	3 = All requirements for that year completed; 1 = Not all requirements for that year completed
1.3a	Development of program standards by NTC national office.	Whether the national NTC office creates and distributes clearly defined program standards to support high-quality mentoring and mentor development.	Copies of the standards	3 = present; 1 = absent
1.3b	Development of formative assessment tools by NTC national office.	Whether the national NTC office creates and distributes formative assessment tools to support high- quality mentoring and mentor development.	Copies of the formative assessment tools	3 = present; 1 = absent
1.3c	Development of mentor training materials by NTC national office.	Whether the national NTC office creates and distributes training materials to support high-quality mentoring and mentor development.	Copies of the mentor training materials	3 = present; 1 = absent
1.3d	Development of online mentoring platform by NTC national office.	Whether the national NTC office creates and grants mentors access to an online platform to support high-quality mentoring and mentor development.	Access to data from the online mentoring platform	3 = present; 1 = absent

Exhibit F-1: Implementation Fidelity Tables (continued)

	Key Elements of Component	Operational Definition for Indicator	Data Source(s) for Measuring Indicator	Implementation Score
Component 2. Mentor Selection and Assignment				
Decision rules for rolling up to the component level for each study site: • High fidelity if greater than 60% of individual indicators are scored as high (3) and less than or equal to 20% of indicators are scored as low (1). • Medium fidelity if individual indicator scores do not reach the threshold for high fidelity (3) and less than 50% of indicators are scored as low (1). • Low fidelity if greater than or equal to 50% of indicators are scored as low (1).				
2.1	Rigorous process for selecting high- quality mentors.	Whether study site follows a rigorous mentor selection process that includes explicit selection criteria, formal job posting, and multiple rounds of screening.	Interviews with NTC leads and site leads/ Staff	3 = High (all steps completed); 2 = Medium (2 steps completed); 1 = Low (0 or 1 step(s) completed)
2.2	Mentors released full time from teaching assignments.	Whether the study site releases all of its mentors from their classroom teaching responsibilities to be full-time mentors.	Mentor survey	3 = 80%+ of mentors released full time; 2 = 60–79% of mentors released full time; 1 = Less than 60% of mentors are released full time.
2.3	Mentors assigned no more than 15 mentees.	Whether each mentor is assigned less than or equal to 15 mentees.	Rosters from each study site and mentor survey	3 = 80%+ of mentors assigned 15 or fewer mentees; 2 = 60–79% of mentors assigned 15 or fewer mentees; 1 = Less than 60% of mentors assigned 15 or fewer mentees.

Exhibit F-1: Implementation Fidelity Tables (continued)

	Key Elements of Component	Operational Definition for Indicator	Data Source(s) for Measuring Indicator	Implementation Score
Component 3. Mentor Development and Accountability				
Decision rules for rolling up to the component level for each study site: • High fidelity if greater than 60% of individual indicators are scored as high (3) and less than or equal to 20% of indicators are scored as low (1). • Medium fidelity if individual indicator scores do not reach the threshold for high fidelity (3) and less than 50% of indicators are scored as low (1). • Low fidelity if greater than or equal to 50% of indicators are scored as low (1).				
3.1a	Mentors participate in mentor academy.	Whether the mentor participates in mentor academies (4 per year).	Attendance records from NTC	3 = 80%+ of mentors attended 80%+ of offered mentor academy days; 2 = 60–79% of mentors attended 80%+ of offered mentor academy days; 1 = Less than 60% of mentors attended 80%+ of offered mentor academy days.
3.1b	Site holds the number of mentor academy days specified by NTC.	Whether the site held all 12 of the mentor academy days specified by NTC.	Attendance records from NTC	3 = Site held at least 90% of mentor academy days; 2 = Site held 76–89% of mentor academy days; 1 = Site held less than or equal to 75% of mentor academy days.
3.2a	Mentors participate in mentor forums.	Whether the mentor participates in mentor forums (12 per year for each year serving as an NTC mentor).	Attendance records from NTC	3 = 80%+ of mentors attended 80%+ of offered mentor forum days; 2 = 60–79% of mentors attended 80%+ of offered mentor forum days; 1 = Less than 60% of mentors attended 80%+ of offered mentor forum days.
3.2b	Site holds the number of mentor forums specified by NTC.	Whether the site held all 12 of the mentor forum meetings specified by NTC.	Attendance records from NTC	3 = Site held at least 90% of mentor forum days; 2 = Site held 76–89% of mentor forum days; 1 = Site held less than or equal to 75% of mentor forum days

Exhibit F-1: Implementation Fidelity Tables (continued)

	Key Elements of Component	Operational Definition for Indicator	Data Source(s) for Measuring Indicator	Implementation Score
3.3	Mentors participate in mentor-to- mentor shadowing,	Whether the mentor participates in mentor- to-mentor shadowing at least once per year in their first year as an NTC mentor and at least twice per year in subsequent years.	Learning Zone (MAGA Tool—Mentor Field Observation Tool)	3 = 80%+ of mentors conducted required shadowing; 2 = 60–79% of mentors conducted required shadowing; 1 = Less than 60% of mentors conducted required shadowing.
3.4	Mentors receive support and feedback from site leads.	Whether the mentor meets with the site lead one on one for at least 3 hours per quarter. Operationalized Y2: 2 full observation cycles and 6 1-1 meetings with program lead.	Learning Zone (MAGA Interaction Log—Time field/ date field—Ad hoc reports)	3 = 80%+ of mentors met with site lead at least 3 hours/quarter for each quarter in year; 2 = 60–79% of mentors met with site lead at least 3 hours/quarter for each quarter in year; 1 = Less than 60% of mentors met with site lead at least 3 hours/quarter for each quarter in year.
3.5	Mentors engage in peer coaching and goal-setting process.	Mentors complete mentor collaborative assessment log; set mentor professional goals using self-assessment summary and ILP; complete mid-year review; and complete mentor professional growth reflection. Y2 operationalized: Peer Coaching: Complete Mentor CAL with Peer Mentor (LM) Goal Setting: Complete three Mentor Assessment: Individual Learning Plans (one each for initial, mid year and end of year)	Learning Zone or hard copy (MAGA Tool Count Report for specific tools of interest– hard copies will be noted in Learning Zone retroactively)	3 = 80%+ of mentors completed peer coaching and goal- setting requirements; 2 = 60–79% of mentors completed peer coaching and goal-setting requirements; 1 = Less than 60% of mentors completed peer coaching and goal-setting requirements.

Exhibit F-1: Implementation Fidelity Tables (continued)

	Key Elements of Component	Operational Definition for Indicator	Data Source(s) for Measuring Indicator	Implementation Score
Component 4. Provision of High-Quality Mentoring Decision rules for rolling up to the component level for each study site: • High fidelity if greater than 60% of individual indicators are scored as high (3) and less than or equal to 20% of indicators are scored as low (1). • Medium fidelity if individual indicator scores do not reach the threshold for high fidelity (3) and less than 50% of indicators are scored as low (1). • Low fidelity if greater than or equal to 50% of indicators are scored as low (1).				
4.1	Mentors meet regularly with new teachers.	Whether mentors meet with each of their new teachers at least 180 minutes per month over at least 7 months.	Learning Zone (Ad Hoc Report – Admin Section – Date and Time Fields)	3 = 80%+ of mentees met with mentor the required amount of time in 7+ months; 2 = 60–79% of mentees met with mentor the required amount of time in 7+ months; 1 = Less than 60% of mentees met with mentor the required amount of time in 7+ months.
4.2	Mentors use NTC's formative assessment system.	Whether mentors use a Formative Assessment System tool for at least 85% of their interactions with beginning teachers.	Learning Zone (Interaction Log – Tool Use Field & Tool Report Count)	3 = 80%+ of mentees had a formative assessment tool completed during at least 85% of meetings with mentor; 2 = 60–79% of mentees had a formative assessment tool completed during at least 85% of meetings with mentor; 1 = Less than 60% of mentees had a formative assessment tool completed during at least 85% of meetings with mentor.
4.3	Mentors document their reflections on mentoring work.	Whether mentors fill out the "goal" field in the Learning Zone interaction log after interacting with beginning teachers.	Learning Zone (Interaction Log— Reflection Section, Item 1—Goal. This is a text field for which we will be looking for non-missing data.)	3 = 80%+ of mentees had "goal" field filled out for 80%+ of interactions with their mentor; 2 = 60–79% of mentees had "goal" field filled out for 80%+ of interactions with their mentor; 1 = Less than 60% of mentees had "goal" field filled out for 80%+ of interactions with their mentor.

Exhibit F-1: Implementation Fidelity Tables (concluded)

	Key Elements of Component	Operational Definition for Indicator	Data Source(s) for Measuring Indicator	Implementation Score
4.4	Mentors focus on instructional practice and on equity and universal access in their work with mentees.	Whether mentors focus on equity and universal access in their instructional mentoring.	Teacher survey	3 = 80%+ of mentees agree or strongly agree that mentoring focused on equity and universal access; 2 = 60–79% of mentees agree or strongly agree that mentoring focused on equity and universal access; 1 = Less than 60% of mentees agree or strongly agree that mentoring focused on equity and universal access.
4.5	New teachers' perceptions of value of mentoring	Extent to which new teachers find the support that they receive from their NTC mentors to be valuable.	Teacher survey	3 = 80%+ of mentees' scores are over 3; 2 = 60–79% of mentees' scores are over 3; 1 = Less than 60% of mentees' scores are over 3.

Calculating Fidelity Scores Across the Full Sample

Fidelity scores were calculated annually for each key component. For specific indicators that were not measured every year (1.1a, 1.1b, 1.2, 1.3a–d, 2.1, as specified above), those individual indicators were excluded from the component-level analysis in the years when they were not measured.

Decision rules for rolling up to the component level for each study site:

- High fidelity if > 60% of individual indicators are scored as high and ≤20 percent of indicators are scored as low.
- Medium fidelity if individual indicator scores do not reach the threshold for high fidelity and < 50 percent of indicators are scored as low.
- Low fidelity if ≥ 50 percent of indicators are scored as low.

Decision rules for rolling up to the component level across study sites:

- High fidelity if at least two sites are scored as high and no sites are scored as low (this is the threshold for implementation "with fidelity" at the program level).
- Medium fidelity if the combination of scores across the three sites does not reach the threshold for high fidelity and no more than one site is scored as low.
- Low fidelity if at least two sites are scored as low.

Appendix G. Teacher Survey Items

Exhibit G-1 displays the items comprising each survey scale.

Exhibit G-1. Items Comprising Each Survey Scale

Items	Scale
Availability of Materials	
To what extent do you agree or disagree with the following statements about your school? Please choose the response that best reflects your experience at your current school. I have the necessary textbooks and print resources to teach. I can get instructional materials (e.g., lab supplies, math manipulatives, classroom library books) without buying them myself. I can get the classroom supplies (e.g., paper, pencils, staples, tape) I need without buying them myself.	Strongly disagree Disagree Agree Strongly agree
Supportive Teaching Environment	
To what extent do you agree or disagree with the following statements about your school? Please choose the response that best reflects your experience at your current school. Teachers in this school trust each other. I feel supported by colleagues to try out new ideas. Teachers in this school feel responsible to help each other do their best. A conscious effort is made by faculty to make new teachers feel welcome here.	Strongly disagree Disagree Agree Strongly agree
Teacher Collaboration Around Instruction	
How often this year do you do each of the following activities with teachers in your school other than with a mentor teacher or consultant? Analyze samples of work done by your students Work together to develop teaching materials or activities for particular classes Seek each other's advice about instructional issues and problems Observe each other's classrooms to offer feedback and/or learn strategies (excluding observation for the purpose of formal evaluation) Discuss student assessment data to make decisions about instruction	Never or once A few times At least monthly At least weekly
Instructional Leadership	
Please rate how strongly you agree or disagree with the following statements about school leadership in your school? (Mark one answer per question.) The faculty and leadership have a shared vision. There is an atmosphere of trust and mutual respect in this school. The majority of teachers in your school feel comfortable raising issues and concerns that are important to them. The school leadership consistently supports teachers. Teacher performance is assessed objectively. Teachers receive feedback that can help them improve teaching. The procedures for teacher evaluation are consistent. The school improvement team provides effective leadership at the school. The faculty are recognized for accomplishments.	Strongly disagree Disagree Agree Strongly agree

Exhibit G-1. Items Comprising Each Survey Scale (continued)

Items	Scale
Student Conduct	
Please rate how strongly you agree or disagree with the following statements about managing student conduct in your school? (Mark one answer per question.)	
Students at this school understand expectations for their conduct. Students at this school follow rules of conduct. Policies and procedures about student conduct are clearly understood by the faculty. School administrators consistently enforce rules for student conduct. School administrators support teachers' efforts to maintain discipline in the classroom. Teachers consistently enforce rules for student conduct. The faculty work in a school environment that is safe.	Strongly disagree Disagree Agree Strongly agree
Frequency of High-Leverage Mentoring Activities	
For the following set of questions, think about the mentoring you have received this school year (including the summer of 2013) through your new teacher support program. (a) How often have you received the following supports from your mentor(s) or consultant(s)?	
My mentor/consultant has observed me teaching and provided feedback My mentor/consultant has worked with me to develop a professional growth plan My mentor/consultant has demonstrated lessons for me in my classroom My mentor/consultant has given me materials My mentor/consultant has planned lessons with me My mentor/consultant has analyzed samples of my students' work My mentor/consultant has talked with me about the strengths and/or needs of specific students My mentor/consultant has discussed instructional issues and problems My mentor/consultant has discussed student assessment data to make decisions about instruction	Never or once A few times At least monthly At least weekly
Value of Mentoring Activities	
For the following set of questions, think about the mentoring you have received this school year (including the summer of 2013) through your new teacher support program. (b) If you received the support, how valuable has it been to your development as a teacher?	
My mentor/consultant has observed me teaching and provided feedback My mentor/consultant has worked with me to develop a professional growth plan My mentor/consultant has demonstrated lessons for me in my classroom My mentor/consultant has given me materials My mentor/consultant has planned lessons with me My mentor/consultant has analyzed samples of my students' work My mentor/consultant has talked with me about the strengths and/or needs of specific students My mentor/consultant has discussed instructional issues and problems My mentor/consultant has discussed student assessment data to make decisions about instruction	Not valuable Minimally valuable Moderately valuable Extremely valuable

Exhibit G-1. Items Comprising Each Survey Scale (continued)

Items	Scale
Focus on Instruction	
Thinking about all the new teacher supports you have received during the 2013–14 school year (including summer 2013), to what extent have they addressed the following topics? The subject matter I teach Instructional techniques appropriate for the grade level/subject matter I teach Classroom management techniques appropriate for the students I currently teach The use of textbooks or other curricular materials for my current position Strategies for interacting with parents of the students I currently teach The use of data (e.g., analyzing student work or student test scores) to plan instruction Adapting instruction to meet the needs of students at varying academic levels Adapting instruction for students with individualized education programs Instructional techniques to meet the needs of students from diverse cultural backgrounds Planning lessons and designing instruction Creating a positive learning environment The use of informal and formal assessment strategies Evaluating and reflecting upon my own teaching practices Using culturally responsive pedagogical practices	Not at all addressed Minimally addressed Moderately addressed Extensively addressed
Frequency of Other Induction Supports	
Think about the services and support you have received this school year (including the summer of 2013) through your new teacher support program. How often have you participated in new teacher meetings with the principal at your school? How often have you participated in workshops, seminars, or classes for new teachers (excluding an initial orientation)? How often have you received release time to see other teachers teach? How often have you participated in a professional development network specifically for new teachers?	Never or once A few times At least monthly At least weekly
Value of Other Induction Supports	
Think about the services and support you have received this school year (including the summer of 2013) through your new teacher support program. How valuable was this to your development as a teacher... in new teacher meetings with the principal at your school? How valuable was this to your development as a teacher... in workshops, seminars, or classes for new teachers (excluding an initial orientation)? How often have you received release time to see other teachers teach? How valuable was this to your development as a teacher... in a professional development network specifically for new teachers?	Not valuable Minimally valuable Moderately valuable Extremely valuable

Exhibit G-1. Items Comprising Each Survey Scale (continued)

Items	Scale
Need for Instructional Support	
Thinking about the 2013–14 school year, indicate the level of support you have needed in the following areas. (Mark one answer per question.) The subject matter I teach Instructional techniques appropriate for the grade level/subject matter I teach The use of data (e.g., analyzing student work or student test scores) to plan instruction Adapting instruction to meet the needs of students at varying academic levels Adapting instruction for students with individualized education programs Instructional techniques to meet the needs of students from diverse cultural backgrounds Planning lessons and designing instruction Creating a positive learning environment The use of informal and formal assessment strategies	No support needed Minimal support needed Moderate support needed Extensive support needed
Teacher-Reported Growth	
Thinking about all the new teacher supports you have received during the 2013-14 school year (including summer 2013), to what extent have they improved your knowledge and skills in the following areas? Deepened my grasp of the subject matter I teach. Increased my knowledge of instructional techniques appropriate for the grade level/subject matter I teach. Improved my classroom management. Increased my effectiveness in using textbooks or other curricular materials. Improved my interactions with parents. Improved my ability to use data (e.g., analyzing student work or student test scores) to plan instruction. Improved my ability to adapt instruction to meet the needs of students at varying academic levels. Increased my ability to adapt instruction for students with individualized education programs. Improved my ability to meet the instructional needs of students from diverse cultural backgrounds. Improved my ability to meet instructional needs of English language learners. Improved my ability to plan lessons and design instruction. Increased my ability to create a positive learning environment. Increased my effectiveness in using informal and formal assessment strategies. Improved my ability to evaluate and reflect upon my own teaching practices. Influenced my decision to stay in the profession.	Not at all Minimal extent Moderate extent Great extent

Exhibit G-1. Items Comprising Each Survey Scale (concluded)

Items	Scale
Teacher Self-Efficacy	
To what extent do you agree or disagree with each of the following statements? (Mark one answer per question.) I am confident in my ability to teach effectively. I can handle a range of challenging classroom management and discipline situations. If a student in my class becomes disruptive and noisy, I know techniques to redirect him/her quickly. I am equally successful in helping students from all racial/ethnic backgrounds to learn. I have the knowledge and skills I need to address the needs of special education students. If I really try hard, I can get through to even the most difficult or unmotivated students. If a student did not remember information I gave in a previous lesson, I would know how to increase his/her retention in the next lesson. If one of my students couldn't do a class assignment, I would be able to accurately assess whether the assignment was at the correct level of difficulty. I am able to adapt instruction so that I meet the needs of students at varying academic levels equally well.	Strongly disagree Disagree Agree Strongly agree
Mentor Support for New Teacher Participation in Other Professional Development	
To what extent has your mentor teacher or consultant supported your participation in the following activities? Common planning time with colleagues Small learning communities focused on instruction Other professional development that the district offers Work with an instructional coach, in addition to the work I do with my mentor/consultant	Not at all Minimal extent Moderate extent Great extent