

2017 TELL Kentucky Survey Student Achievement and Teacher Retention Analyses



Diane Downs, the music teacher at Norton Elementary, asks students who was able to keep up with a rhythm for a song. Downs is uses her class to help drive home concepts for core classes for students. Photo by Bobby Ellis, Oct. 26, 2017

INTRODUCTION

The 2017 TELL Steering Committee¹, comprised of stakeholder groups representing teachers, superintendents, community and business, worked collaboratively with the New Teacher Center (NTC) to administer the fourth iteration of the Kentucky Teaching, Empowering, Leading, and Learning Survey (TELL Kentucky Survey) in spring 2017. The survey assesses whether educators across the state report having the resources and supports necessary to encourage effective teaching.

The TELL Kentucky Survey is a full-population survey based on the NTC TELL Survey first developed in the North Carolina Governor's Office in 2002. It has since been replicated in more than 20 states and captured the voices of more than 1.5 million educators, providing critical data to support school improvement efforts. Specifically, the survey is designed to report educators' perceptions of teaching and learning conditions organized into the following eight constructs: Time, Facilities and Resources, Professional Development, School Leadership, Teacher Leadership, Instructional Practices and Support, Managing Student Conduct, and Community Support and Involvement (see Appendix A).

A series of NTC briefs provides results from the 2017 TELL Kentucky Survey describing preliminary findings and group comparisons. These resources can be found on the TELL Kentucky website under the Research tab (<http://www.tellkentucky.com/research>).

This report establishes the research foundation specifically linking teaching conditions as measured by the NTC TELL Survey to student achievement and teacher retention outcomes, provides information on response rates to the 2017 TELL Kentucky Survey, tests the association between 2017 TELL Kentucky survey data and student and teacher outcomes, and summarizes school-level descriptive information. The purpose of this report is to help stakeholders better understand the relationship between teaching conditions and outcomes of interest in Kentucky.

The current education policy context demands a more nuanced understanding of the association between teaching and student learning. Stakeholders want to better understand the conditions that support teacher contributions to student learning (Hanushek & Rivkin, 2007; Steele, Hamilton, & Stecher, 2010) as a growing body of research indicates that school environments can encourage or constrain good teaching (Johnson & the Project on the Next Generation of Teachers, 2004; McLaughlin & Talbert, 2001). This work is summarized below as background to the TELL Kentucky analyses.



Tiffany Marsh, 2019 Kentucky High School Teacher of the Year. Photo by Bobby Ellis, May 4, 2018

ABOUT TELL

The TELL Kentucky Survey is a full-population survey based on the NTC TELL Survey first developed in the North Carolina Governor's Office in 2002. It has since been replicated in more than 20 states and captured the voices of more than 1.5 million educators, providing critical data to support school improvement efforts. Specifically, the survey is designed to report educators' perceptions of teaching and learning conditions organized into the following eight constructs:

- Time
- Facilities and Resources
- Professional Development
- School Leadership
- Teacher Leadership
- Instructional Practices and Support
- Managing Student Conduct
- Community Support and Involvement

See Appendix A for a list of survey items for each construct.

¹The 2017 TELL steering committee included: Stephen Pruitt (Kentucky Department of Education), Stephanie Winkler (Kentucky Education Association), Donna House & Amy Floyd (Kentucky Association of Professional Educators), Jimmy Adams (Education Professional Standards Board), Robert King (Council on Postsecondary Education), Brigitte Blom Ramsey and Cory Curl (Prichard Committee for Academic Excellence), Mike Armstrong (Kentucky School Boards Association), William Twyman (Kentucky Board of Education), Wayne Young (Kentucky Association of School Administrators), Tom Shelton (Kentucky Association of School Superintendents), Ronda Harmon and Cindy Blevins (Kentucky Association of School Councils), Brent McKim and Tammy Berlin (Jefferson County Teachers Association), Cherie Dimar (Kentucky Parent Teacher Association), Ron Skillern (2017 Kentucky Teacher of the Year).

PROVIDING TEACHERS WITH THE BEST OPPORTUNITY TO BE EFFECTIVE

CONNECTIONS BETWEEN TEACHING CONDITIONS AND STUDENT LEARNING

A positive school context, capable leadership, and a collaborative working environment facilitate teacher success. In particular, research shows that strong, trusting relationships—both internal and external—and supportive school leadership are linked to improved student achievement (Johnson, 2006; Bryk & Schneider, 2002). In addition, in schools where teachers talk to each other about their work and principals communicate with the community, students have higher reading and mathematics test scores than students in schools where these conditions are not as prevalent. Additionally, these conditions may have a greater impact on test scores than the experience or credentials of the staff (Leana & Pil, 2006).

NTC TELL Survey data have been used to establish a link between staff perceptions of teaching and learning conditions and student achievement (e.g., Ladd, 2009; Johnson, Kraft, and Papay, 2011; Ferguson & Hirsch, 2014). Recent work by Kraft and Papay (2014) found that teachers who work in more supportive environments became more effective at raising student achievement on standardized tests over time than did teachers who worked in less supportive environments, after controlling for student characteristics, prior test scores, and teacher and school characteristics. They found that *teachers in schools that had the most positive teaching conditions (in the 75th percentile as measured by 24 questions in NTC's TELL Survey) were 38 percent more effective after a decade than teachers in schools in the 25th percentile. Over two years, teachers were 11 percent more effective if they worked in schools with positive teaching conditions.*

Teaching and Learning Conditions Assessed by the TELL Survey



CONNECTIONS BETWEEN TEACHING CONDITIONS AND TEACHER RETENTION

A host of large-scale empirical studies provide evidence that contextual factors also matter in teachers' decisions about staying or leaving schools. Results of a meta-analysis of 34 studies by Borman and Dowling (2008) revealed that teaching and learning conditions influence teachers' career paths more than previously documented. Boyd et al. (2011) demonstrated that teachers' perceptions of the school administration have the greatest influence on teacher retention decisions. Other work finds similar effects (see, for example, Pogodzinski, Youngs, Frank, & Belman, 2012). Several studies also find strong relationships between teachers' perceptions of school facilities and their plans to stay or leave (Loeb, Darling-Hammond, & Luczak, 2005; Buckley, Schneider, & Shang, 2004).

Using NTC TELL survey data, Johnson, Kraft, and Papay (2011) found that teachers were more satisfied and planned to stay longer in schools with positive teaching conditions. Their work suggests that conditions such as a trusting atmosphere, principal leadership, and collaborative colleagues are as important, or more important, than conditions such as facilities and resources in influencing teachers' decisions to stay in schools. This finding holds true after controlling for student and school characteristics such as the percentage of students categorized as low income. Ladd (2009), also using TELL data, found that teaching and learning

conditions predict teacher plans to leave a school, independent of school demographics.

This robust research foundation demonstrates a consistent link between teaching conditions and both student achievement and teacher retention outcomes. The following analyses add to this work by analyzing 2017 TELL Kentucky Survey data. This brief provides a summary of survey participants and analyses of state- and school-level data to help stakeholders understand which teaching conditions matter most in promoting teacher and student success.

2017 TELL KENTUCKY RESULTS

NTC administered the 2017 TELL Kentucky Survey to all school-based licensed educators March 1-31, 2017. The data for these analyses include responses from more than 40,000 educators in Kentucky, yielding a response rate of 91 percent. This represents a two-percent increase in response rate compared to the 2015 response rate (89%). This distribution of responses by role presented in Table 1 is similar to the data collected in 2015.

Table 1.

Percent of Total Respondents by Participant Type

Respondents*	Percent of Total Respondents (N)
Teacher	90.6% (37,600)
Principal	1.6% (679)
Assistant Principal	1.9% (701)
Other Education Professional	6.1% (2,522)
Total	41,502

*Note. The respondent category "Teachers" includes instructional coaches, department heads, literacy specialists, etc. The respondent category "Other Education Professionals" includes school counselors, school psychologists, social workers, etc.

Response rates varied by school type (Table 2). Of the 1,433 schools across the state of Kentucky, 1,316 met or exceeded the 50 percent minimum response rate threshold (with at least five respondents) to have access to individual school-level reports on their survey results (92%). Those results can be accessed at <http://tellkentucky.org/results>.

The goal of these analyses is to better understand how teaching conditions intersect with student performance and teacher retention within the context of Kentucky schools. When compared to schools with less favorable conditions, do schools with better teaching conditions have better student performance and/or stronger teacher retention?

A detailed discussion of methodology can be found in Appendix B. The Kentucky Performance Rating for Educational Progress (K-PREP) is used here to measure student proficiency in both reading and mathematics. In addition, student growth was examined based on Kentucky's Student Growth Percentile, which compares a student's test scores to the student's academic peers using two years of test scores in both reading and mathematics. These analyses use the percentage of students making adequate growth (percentage of students at or above the 40th percentile) at the school-level. The Kentucky Department of Education's (KDE) Learning Environment Equity measure, Percentage of Teacher Turnover, which measures the proportion of teachers that left teaching in a given school, is used in this analysis to estimate teacher retention at the school

Table 2.
Survey Response Rates by School Type, 2015 and 2017

School Type	Responded		Headcount		Response Rate	
	2015	2017	2015	2017	2015	2017
Elementary	22,995	19,537	25,040	21,091	61.4%	39.7%
Middle	8,159	9,115	9,115	9,823	57.4%	33.6%
High	11,510	10,553	13,449	12,203	54.0%	29.7%
Special	2,269	2,297	2,699	2,516	55.8%	36.5%
Total	44,933	41,502	50,303	45,633	89.3%	90.9%

level. Additional variables of interest were gathered from the datasets available through the KDE website². The teaching conditions measures include both an overall composite average across all eight constructs as well as separate measures for each construct (see Appendix A). All data are examined at the school level.

Using statistical approaches appropriate for school-level data, these analyses isolate the effect of teaching conditions from other factors that research suggests are related to student academic performance, such as student, teacher, and school characteristics. Separate analyses are completed for elementary, middle, and high schools. Grade level for the analysis is determined by the capstone grade offered (e.g., K-5 are considered elementary schools, K-8 are considered middle schools, K-12 are considered high schools, etc.)

Findings in the models can be interpreted as follows: after controlling for other student, teacher, and school-level variables, for every 1-point change in the teaching conditions variable mean (where a mean of 1 represents a school where educators “Strongly Disagree” and a mean of 4 indicates a school where educators “Strongly Agree” that the given teaching condition is in place), the outcome variable of interest (Student Achievement, Academic Growth, or Teacher Retention) would increase or decrease by the value of the given coefficient. Changes in teaching conditions variable means of half a point or less are more common; however, to make model interpretation easier, a standard 1-point change in the mean is used. See Appendix B for a full discussion of statistical modeling and variables.

²<http://applications.education.ky.gov/SRC/DataSets.aspx>

HOW KENTUCKY TEACHING CONDITIONS IMPACT SCHOOLS

Teaching Conditions and Student Achievement Results

Teaching conditions matter for student reading and math achievement. Results suggest a positive relationship exists between overall teaching conditions composite score and the percentage of students at or exceeding grade level proficiency in both math and reading in elementary and middle schools. This positive relationship between overall teaching conditions and student achievement is also present in high schools but only for math (Algebra 1) when looking at all students combined (See Appendix C, Models 1.1-2 & 2.1-3).

Economically disadvantaged student performance in both math and reading is positively related to teaching conditions at all levels. Examining the relationship between teaching conditions and student achievement for economically disadvantaged (i.e., free and reduced-price lunch eligible) students reveals that overall teaching conditions are a statistically significant predictor of both math and reading performance (Algebra 1 and English 2 for high school) at all levels. This finding is notable given that no significant relationship was found between the TELL composite and English 2 performance in the full student population analysis (See Appendix C, Models 3.1-4.3).

Of the eight constructs measured by the TELL Kentucky Survey, Community Support and Involvement, Managing Student Conduct, and Instructional Practice and Support are the most predictive of elementary and middle school student achievement in math and reading. All eight of the teaching condition construct composites measured by the TELL Kentucky Survey are positively related with elementary and middle school student achievement in both math and reading. Community Support & Involvement, Managing Student Conduct, and Instructional Practices & Support explained the most variance (See Appendix C, Models 5.1-2 & 6.1-2).



Students from Mount Washington Elementary School (Bullitt County) work on their rubber band powered car as part of the District STEM Challenge. Photo by Bobby Ellis, March 8, 2018

Community Support & Involvement, Use of Time, and Instructional Practices & Support are the most important conditions for high school math student achievement. All eight constructs were positive predictors of high school student Algebra 1 achievement. In particular, Community Support & Involvement explained 6.4% of the variance in student math achievement. Use of Time, Instructional Practices & Support, and Managing Student Conduct each explained about 5% of the variance in student achievement (See Appendix C, Model 6.3). None of the eight constructs were statistically significant predictors of high school student achievement in English 2.

For economically disadvantaged students, Community Support & Involvement, Managing Student Conduct, and Instructional Practices & Support are the top predictors of student achievement in reading and math. All eight constructs have a positive relationship with free-and-reduced lunch (FRL) student achievement in both math and reading at all levels. Community Support & Involvement, Managing Student Conduct, and Instructional Practices & Support are the top contributors for each level. An examination of the results by level

reveal that a greater portion of variation in FRL student math and reading achievement is attributed to teaching conditions at the elementary and high school levels compared to middle school (See Appendix C, Models 7.1-8.3).

Community Support & Involvement and Managing Student Conduct are consistently correlated with higher reading and math growth rates at the Elementary and Middle school levels. Several constructs were found to be positively correlated with student growth. In addition to Community Support & Involvement and Managing Student Conduct being positive predictors of math and reading growth, Facilities and Resources was also positively associated student growth in math for both elementary and middle school students (See Appendix D, Models 9.1-10.2).

Teaching Conditions and Teacher Retention Analyses

Community Support & Involvement, Teacher Leadership, and School Leadership are positively related to middle school teacher retention.

Results suggest that all eight aspects of teaching conditions measured by the TELL Kentucky Survey are related to teacher retention in Middle Schools. Of the eight constructs, Community Support & Involvement, Teacher Leadership, and School Leadership accounted for the most variance in the individual construct models (See Appendix E, Table 14.2). Facilities & Resources was the only teaching conditions construct average that was a statistically significant predictor of teacher retention at the elementary level. However, the finding related to Facilities & Resources construct average at the elementary level is not practically significant as the variable explains less than 1% of the overall variance in the model. No teaching conditions construct averages were statistically significant predictors of teacher retention at the high school level.



Jessica Dueñas helps Jadeynn White with a question during an English class at Oldham County Middle School. Dueñas was the 2019 Kentucky Teacher of the Year Photo by Bobby Ellis.

SUMMARY

Teaching conditions are significant predictors of student math achievement at all levels, and for reading in elementary and middle schools when looking at all students. When focusing on FRL students, the present analyses yielded significant relationship between teaching conditions and student performance in both reading and math at all levels. Community Support & Involvement is consistently shown to be related to positive student achievement outcomes across all levels—even for economically disadvantaged students. Managing Student Conduct is also regularly associated with positive student outcomes—in terms of absolute student achievement as well as growth—for elementary and middle school students in both reading and math. Instructional Practices & Support is positively correlated with reading at the elementary and middle

school levels and with math at all levels (Algebra 1 for high school).

Teaching conditions are statistically significant predictors of teacher retention but only at the middle school level. Although all eight teaching condition averages were statistically significant predictors of middle school teacher retention, Community Support & Involvement, Teacher Leadership, and School Leadership were most strongly associated with positive teacher retention outcomes.

The findings from this analysis are consistent with the findings from the 2015 TELL Kentucky Student Achievement and Teacher Retention Analysis. However, this report includes a few important changes from the 2015 analysis—1) the teaching condition variables are added in the last step of each model in order to more accurately represent the amount of variance explained by teaching conditions for each outcome; 2) given that the teaching condition construct averages are highly correlated, separate models were specified for each construct and results were discussed both in terms of within (the statistical significance of the relationship between the individual teaching condition variable and the outcome variable) and across models (the amount of variance explained by each individual construct average; 3) effects of teaching conditions on student achievement was examined for the free-and-reduced lunch student subgroup.

Given the results of this analysis, it seems that a focus on **Community Support & Involvement, Managing Student Conduct**, and **Instructional Practices & Support** have the most potential for moving the needle in terms of improving student and teacher outcomes.

At the local level, school leaders should conduct an analysis of their survey results at the item level in an effort to identify 1) specific areas that could be improved by implementing a local intervention/policy and 2) areas that appear to be benefiting from current policy at the local level. The results are not intended to be used in any punitive manner, but instead, as a starting point for conversations about what specific supports educators need most.



National Board Certified teachers in Kentucky. Photo by Bobby Ellis, February 20, 2018.

One limitation of this analysis is the ability to directly connect

respondent-level perception data to the student achievement and teacher retention data. In an ideal scenario, the analysis would link the student achievement for the respondent's students thus isolating the relationship between the educator's perceptions of the teaching conditions in their school and their students' academic performance. Likewise, a linkage of teacher retention data to individual respondents would also allow for a more precise analysis of how teaching conditions and teacher retention are related. Although the anonymous nature of the survey provides a safe platform for educators to voice their opinions without fear of retaliation, it does hinder the power of the analysis in some respect.

Another limitation of this analysis is related to the free-and-reduced lunch (FRL) student analysis. The student achievement data were reported for the FRL population but not for the non-FRL group. Due to this, it was not possible to measure for differences between FRL and non-FRL students.

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APPENDIX A

TELL Items, Constructs, and Composite Calculations

Table 1A.

TELL Constructs and Associated Items

Construct	Survey Items
Use of Time —Available time to plan, to collaborate, to provide instruction, and to eliminate barriers in order to maximize instructional time during the school day	Class sizes are reasonable such that teachers have the time available to meet the needs of all students.
	Teachers are allowed to focus on educating students with minimal interruptions.
	The non-instructional time provided for teachers in my school is sufficient.
	Efforts are made to minimize the amount of routine paperwork teachers are required to do.
	Teachers have sufficient instructional time to meet the needs of all students.
	Teachers are protected from duties that interfere with their essential role of educating students.
	Teachers have time available to collaborate with colleagues.
Facilities and Resources —Availability of instructional, technology, office, communication, and school resources to teachers	Teachers have sufficient access to appropriate instructional materials.
	Teachers have sufficient access to instructional technology, including computers, printers, software and internet access.
	Teachers have access to reliable communication technology, including phones, faxes and email.
	Teachers have sufficient access to office equipment and supplies such as copy machines, paper, pens, etc.
	Teachers have sufficient access to a broad range of professional support personnel.
	The school environment is clean and well maintained.
	Teachers have adequate space to work productively.
	The physical environment of classrooms in this school supports teaching and learning.
	The reliability and speed of Internet connections in this school are sufficient to support instructional practices.
	Teachers and staff work in a school that is environmentally healthy.

Community Support & Involvement— Community and parent/guardian communication and influence in the school	Parents/guardians are influential decision makers in this school.
	This school maintains clear, two-way communication with parents/guardians and the community.
	This school does a good job of encouraging parent/guardian involvement.
	Teachers provide parents/guardians with useful information about student learning.
	Parents/guardians know what is going on in this school.
	Parents/guardians support teachers, contributing to their success with students.
	Community members support teachers, contributing to their success with students.
	The community we serve is supportive of this school.
	This school works with parents/guardians to improve the learning environment in students' homes.
Managing Student Conduct— Policies and practices to address student conduct issues and ensure a safe school environment	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.
	Students and the faculty make efforts to stop bullying in this school.
Teacher Leadership— Teacher involvement in decisions that impact classroom and school practices	Teachers are recognized as educational experts.
	Teachers are trusted to make sound professional decisions about instruction.
	Teachers are relied upon to make decisions about educational issues.
	Teachers are encouraged to participate in school leadership roles.
	The faculty has an effective process for making group decisions to solve problems.
	In this school we take steps to solve problems.
	Teachers are effective leaders in this school.

School Leadership —The ability of school leadership to create trusting, supportive environments and address teacher concerns	The faculty and leadership have a shared vision.
	There is an atmosphere of trust and mutual respect in this school.
	Teachers feel comfortable raising issues and concerns that are important to them.
	The school leadership consistently supports teachers.
	Teachers are held to high professional standards for delivering instruction.
	The school leadership facilitates using data to improve student learning.
	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 this school.
	The faculty are recognized for accomplishments.
	The school leadership communicates clear expectations to students and parents.
Professional Development —Availability and quality of learning opportunities for educators to enhance their teaching	Sufficient resources are available for professional development in my school.
	An appropriate amount of time is provided for professional development.
	Professional development offerings are data driven.
	Professional learning opportunities are aligned with the school's improvement plan.
	Professional development is differentiated to meet the needs of individual teachers.
	Professional development deepens teachers' content knowledge.
	Teachers are encouraged to reflect on their own practice.
	In this school, follow up is provided from professional development.
	Professional development provides ongoing opportunities for teachers to work with colleagues to refine teaching practices.
	Professional development is evaluated and results are communicated to teachers.
	Professional development enhances teachers' ability to implement instructional strategies that meet diverse student learning needs.
	Professional development enhances teachers' abilities to improve student learning.

Instructional Practices & Support —Data and support available to teachers to improve instruction and student learning	State assessment data are available in time to impact instructional practices.
	Local assessment data are available in time to impact instructional practices.
	Teachers use assessment data to inform their instruction.
	Teachers work in professional learning communities to develop and align instructional practices.
	Provided supports (i.e. instructional coaching, professional learning communities, etc.) translate to improvements in instructional practices by teachers.
	Teachers are encouraged to try new things to improve instruction.
	Teachers are assigned classes that maximize their likelihood of success with students.
	Teachers have autonomy to make decisions about instructional delivery (i.e. pacing, materials and pedagogy).
	Our students come to school ready to learn.

Composite and Construct Average Calculations

The construct averages and overall composite average are calculated at the respondent level and then aggregated to the school level for these analyses. All of the items included are on the same Likert agreement scale where 1 = Strongly Disagree, 2 = Disagree, 3 = Agree, 4 = Strongly Agree, and 5 = Don't Know. For these calculations, responses of "Don't Know" were coded as missing. The construct averages were then calculated by averaging the coded responses for the items associated with each given construct (shown in Table 1A) at the respondent level. The equation (1) for the respondent-level calculation is shown below.

$$(1) \text{ Construct Average}_i = \frac{\sum(\text{Coded Item Responses})}{\# \text{ Items in Construct}}$$

The Overall Composite Average was calculated by averaging the Construct Averages at the respondent level. The equation (2) for the respondent-level Overall Composite is shown below.

$$(2) \text{ Overall Composite Average}_i = \frac{\sum(\text{Construct Averages})}{\# \text{ Constructs}}$$

Once calculated at the respondent level, these figures are then averaged across respondents at the school level. The school-level equations are shown below.

$$(3) \text{ Construct Average}_j = \frac{\sum(\text{Construct Average}_{ij})}{\# \text{ Respondents}_j}$$

$$(4) \text{ Construct Average}_i = \frac{\sum(\text{Overall Composite}_{ij})}{\# \text{ Respondents}_j}$$

APPENDIX B

Model Specification and Variables

Model Specifications

Statistical models appropriate for school-level data test the relationship between teaching conditions and student achievement using Ordinary Least Squares (OLS) regression. The OLS equation assumes there is a linear association between the outcome variable and the independent variable. For example, OLS assumes changes in teaching conditions are associated with changes in student achievement and better teacher conditions are associated with better student achievement. An advantage of OLS is that it allows the relationship between teaching conditions and outcome variables to be isolated by controlling for other factors, such as teacher and student background characteristics. The following equation (1) specifies the regression model using percentage proficient in reading and math using the same model twice, once for each subject area, as the outcome variable:

$$Y_i = \beta_0 + \beta_1(\text{Student}) + \beta_2(\text{Teacher}) + \beta_3(\text{School}) + \beta_4(\text{Teaching Conditions}) + \beta_i$$

For each analysis, variables are added to the model by block (i.e., Student, Teacher, School, and Teaching Conditions) in a stepwise manner. As such, the first model includes student-related variables only. The second model includes statistically significant student-related and teacher-related variables. The third model includes statistically significant student, teacher, and school-level variables. The final model includes all statistically significant student, teacher, and school-related variables as well as the TELL predictor(s) (Overall Composite or Construct Rates of Agreement), which are included in all final models regardless of statistical significance. Since only statistically significant variables are retained in the model for student, teacher, and school-related variables, there may be some tables which display less than four models.

All variable calculations are at the school level. The outcome variable Y_i in model (1) is the percent of students scoring proficient or above in reading and math. The intercept (β_0) represents the value of the outcome variable when all the independent variables are at zero. The independent variables are represented by β_1 -4 and include blocks of characteristics about students, teachers, schools, and teaching conditions. Full descriptions of variables included in each block for these analyses are provided below. Examples of independent variables include:

- Student-related predictors: Percent of minority students in the school, percent of students with free/reduced-price lunch, percent of students with limited English proficiency, etc.
- Teacher-related predictors: percent with advanced certification, percent with standard certification, etc.
- School-related predictors: Student-to-teacher ratio, Wealth per Pupil, etc.

The teaching conditions measures consist of the average of the eight construct rates of agreement for each school. The β , or betas, are values, one for each explanatory variable, that represent the strength and type of relationship the independent variable has to the dependent variable. If the β is positive, then as the independent variable increases, the outcome variable increases. If the β is negative, then as the independent variable increases, the outcome variable decreases. The β_i is the error term or the difference between the expected value generated by the regression equation and the observed value in the data for each school in this case.

The teacher retention regression model (2) follows a similar equation as presented for the student outcome model. The calculated teacher retention variable (percent of teachers reporting "continue teaching at my current school" as their immediate professional plans) is the outcome variable Y_i .

$$Y_i = \beta_0 + \beta_1(\text{Student}) + \beta_2(\text{Teacher}) + \beta_3(\text{School}) + \beta_4(\text{Teaching Conditions}) + \beta_i$$

Outcome Variables

Student Achievement

Student performance is measured for both reading and math using the percent of the number of students accountable for 100 days enrolled, which can be categorized as Proficient and Distinguished for each given subject. Proficient classification is determined by the NAPD calculation. [Derived from the formula: Novice = 0; Apprentice = .5; Proficient/Distinguished = 1 (Bonus of .5 added if there are more Distinguished than Novice)]. The K-PREP for reading and math is administered in grades 3–8 and thus serves as the student performance indicator for Kentucky elementary and middle schools.

The reading and math student performance indicator for Kentucky high schools used for this analysis are the state-required End-of-Course exams in Algebra II and English II, which are administered at the conclusion of coursework. Students receive a scale score and the performance level of Novice, Apprentice, Proficient, or Distinguished. High schools must test all students but are accountable only for students enrolled a full academic year (100 days or more).

Academic Growth

Academic growth is Kentucky's Student Growth Percentile, which compares an individual student's score to the student's academic peers using two years of test scores. It is reported for grade levels 4–8 and 11 in the subjects of reading and math. Students must be enrolled a full academic year (100 days) to be considered.

Teacher Retention

In 2015–16, KDE began tracking percent of teacher turnover as part of a push to learn more about how teacher retention relates to student achievement. Percent of teacher turnover is calculated at the school level and is defined as "Teachers who left the classroom within a school, regardless of whether reemployed at the same school (in a non-teaching role), in another district, moved within district, left KY Public School system or retired." For this analysis, teacher retention is calculated as 1 minus the percent of teacher turnover for each given school.

Independent Variables Considered in the Models

School characteristics

- **Parents on Council:** Number of Parents/Guardians Serving on the School Council (SBDM) or its Committees as reported by the school.
- **Student-to-Teacher Ratio:** The total enrollment of the school divided by the number of teachers on an FTE basis, not including administrators, guidance counselors, or media specialists.
- **Expenditures per student:** Current expenditures divided by the total primary through grade 12 end-of-year Average Daily Attendance in the school. School-level spending per student is self-reported by the schools.
- **Total Membership:** All enrollments minus all withdrawals for entry level primary (K) through grade 12 students on the last day of the reporting period, as reported to the Kentucky Department of Education by the local superintendent at close of year via the Superintendent's Annual Attendance Report (SAAR). This value is the same as the ethnic count.

Teacher characteristics

- **Percent Male Educators:** The Percent Male Educators is generated by dividing the number of male educators (as reported by KDE) by the total number of educators [$\# \text{ male educators} / \text{total} \# \text{ edu-}$

cators] at the school level.

- **Percent Minority Educators:** The Percent Minority Educators is generated by dividing the number of white educators (as reported by KDE) by the total number of educators and subtracting that amount from one [$1 - (\# \text{ white educators} / \text{total} \# \text{ educators})$] at the school level.
- **Percent Beginning Teachers:** Total percent of first-year and Kentucky Teacher Internship Program (KTIP) teachers in the school, district, or state. Includes those teachers who did not teach in KY the previous year and all KTIP teachers.
- **Average Years of Experience:** This includes the average number of years of professional experience of classroom teachers, excluding certified staff such as administrators, counselors, and media specialists.
- **Calculated Teacher Retention:** Calculated as 1 minus the percent of teacher turnover (as reported by KDE) for each given school ($1 - \% \text{ teacher turnover}$).
- **Number of Teachers Certified by National Board for Professional Standards:** The following job class codes are counted: 2010, 2025, 2030, 2040, 2050, 2060, 2070, 2080, 2090, 2095, 2096, 2099, 2100, 2210, and 2211 per KDE.
- **Average Teacher Salary:** Teacher Salary is the average salary for a teacher based on the Professional Staff Data report submission at the district level. (Sum of teacher salaries in object codes 0110, 0111, and 0112 divided by the FTE Certified Staff – Teachers, which is FTE multiplied by Allocation percentage for all certified staff in summary class codes 2010, 2025, 2030, 2040, 2050, 2060, 2070, 2080, 2090, 2095, 2096, 2099, 2100, and 2211 within object code 0110 from Professional Staff Data Report.)

Student characteristics

- **Percent Male Students:** The Percent Male Students is generated by dividing the number of male students (as reported by KDE) by the total number of students [$\# \text{ male students} / \text{total} \# \text{ students}$] at the school level.
- **Percent Minority Students:** The Percent Minority Students is generated by dividing the number of white students (as reported by KDE) by the total number of students and subtracting that amount from 1 [$1 - (\# \text{ white students} / \text{total} \# \text{ students})$] at the school level.
- **Economically Disadvantaged:** An economically disadvantaged student is one who qualifies for either the free or reduced-price lunch program. The Federal National School Lunch Act establishes eligibility for the reduced-price lunch program for families with income up to 185 percent of the federal poverty level (in 2015, this amount was \$44,863 for a family of four). Families with income up to 130 percent of the federal poverty level qualify for the free lunch program (in 2015, this amount was \$31,525 for a family of four).
- **Attendance Rate:** The attendance rate provides the percent of attendance for all students and is collected from primary through grade 12.

APPENDIX C

Student Achievement

Reading Achievement by Overall Composite

Elementary School Results. Table 1.1C presents information from the OLS model (1) where the outcome variable is the elementary school student performance on the K-PREP Reading assessment and teaching conditions is represented as a composite measure across all eight constructs (See Appendix B for calculations).

Model 1.1C. Model Summary Explaining Elementary School Student Reading Achievement by Overall Teaching Conditions Composite (N=543)

Variable	Model 1		Model 2		Model 3	
	B	SE(B)	B	SE(B)	B	SE(B)
Intercept	83.671**	1.566	75.852**	3.462	27.111**	6.272
% Free-and-Reduced Lunch Students	-36.804**	2.410	-34.21**	2.349	-31.17**	2.215
% Minority Students	-22.709**	1.780	-17.78**	1.855	-14.79**	1.760
Average Teacher Experience			0.645**	.202	0.603**	.189
% Beginning Teachers			-19.81**	5.770	-15.28**	5.402
Overall Teaching Conditions Composite					14.47**	1.596
R ²	0.53		0.57		0.63	

* $p < .05$. ** $p < .01$.

Reading Achievement by Overall Composite

Middle School Results. Table 1.2C presents information from the OLS model (1) where the outcome variable is the middle school student performance on the K-PREP Reading assessment and teaching conditions is represented as a composite measure across all eight constructs (See Appendix B for calculations).

Model 1.2C. Model Summary Explaining Middle Student Reading Achievement by Overall Teaching Conditions Composite (N=262)

Variable	Model 1		Model 2		Model 3		Model 4	
	B	SE(B)	B	SE(B)	B	SE(B)	B	SE(B)
Intercept	-1.69	47.072	-23.159	44.586	-22.436	43.564	-29.585	42.206
attendance	97.858*	47.501	102.811*	44.840	116.72**	43.978	93.095*	42.935
% Free-and-Reduced Lunch Students	-22.579**	4.266	-20.93**	4.037	-24.62**	4.073	-25.015**	3.944
% Minority Students	-30.902**	2.925	-25.21**	2.936	-24.92**	2.870	-21.410**	2.898
% Male Students	-26.638**	9.040	-24.21**	8.542	-25.01**	8.349	-24.697**	8.083
Average Teacher Experience			1.152**	.202	1.178**	.197	1.065**	.193
Student-to-Teacher Ratio					-0.748**	.206	-0.598**	.203
Overall Teaching Conditions Composite							8.855**	2.082
R ²	0.44		0.51		0.53		0.56	

* $p < .05$. ** $p < .01$.

English II EOC Achievement by Overall Composite

High School Results. Table 1.3C presents information from the OLS model (1) where the outcome variable is the high school student performance on the K-PREP English II EOC assessment and teaching conditions is represented as a composite measure across all eight constructs (See Appendix B for calculations).

Model 1.3C. Model Summary Explaining High Student English II EOC Achievement by Overall Teaching Conditions Composite (N=157)

Variable	Model 1		Model 2		Model 3		Model 4	
	B	SE(B)	B	SE(B)	B	SE(B)	B	SE(B)
Intercept	-91.380**	20.743	-83.55**	19.394	-129.6**	27.387	-127.11**	28.852
attendance	176.458**	20.178	171.22**	18.832	190.326*	20.264	190.499*	20.335
% Free-and-Reduced Lunch Students	-26.222**	5.639	-21.27**	5.350	-16.71**	5.618	-16.960**	5.702
% Minority Students	-17.781**	4.111	-16.79**	3.836	-21.49**	4.277	-21.429**	4.295
% Beginning Teachers			-43.23**	8.784	-38.74**	8.865	-39.381**	9.180
Average Teacher Salary					0.514*	.219	0.519*	.220
Overall Teaching Conditions Composite							-0.854	3.015
R ²	0.62		0.67		0.68		0.68	

* $p < .05$. ** $p < .01$.

Math Achievement by Overall Composite

Elementary School Results. Table 2.1C presents information from the OLS model (1) where the outcome variable is the elementary student performance on the K-PREP Math assessment and teaching conditions is represented as a composite measure across all eight constructs (See Appendix B for calculations).

Model 2.1C. Model Summary Explaining Elementary Student Math Achievement by Overall Teaching Conditions Composite (N=543)

Variable	Model 1		Model 2		Model 3	
	B	SE(B)	B	SE(B)	B	SE(B)
Intercept	-105.297	59.285	-89.78	57.460	-142.56**	53.231
attendance	187.365**	60.586	174.19**	58.704	157.88**	54.130
% Free-and-Reduced Lunch Students	-29.970**	4.090	-28.59**	3.967	-24.97**	3.674
% Minority Students	-19.145**	2.538	-14.48**	2.574	-9.884**	2.418
% Beginning Teachers			-38.13**	6.277	-30.98**	5.831
Overall Teaching Conditions Composite					20.131**	2.051
R ²	0.36		0.4		0.5	

* $p < .05$. ** $p < .01$.

Math Achievement by Overall Composite

Middle School Results. Table 2.2C presents information from the OLS model (1) where the outcome variable is the middle school student performance on the K-PREP Math assessment and teaching conditions is represented as a composite measure across all eight constructs (See Appendix B for calculations).

Model 2.2C. Model Summary Explaining Middle School Student Math Achievement by Overall Teaching Conditions Composite (N=257)

Variable	Model 1		Model 2		Model 3		Model 4	
	B	SE(B)	B	SE(B)	B	SE(B)	B	SE(B)
Intercept	-110.906	61.889	-121.69*	60.385	-135.24*	59.075	-147.665*	57.182
membership	0.004	.004	0	.004	0.008	.004	0.012**	.004
attendance	202.812**	62.096	193.01**	60.575	226.087* *	59.837	201.08**	58.138
% Free-and-Reduced Lunch Students	-27.615**	5.968	-28.49**	5.821	-29.75**	5.694	-29.168**	5.506
% Minority Students	-27.271**	4.160	-21.91**	4.296	-25.81**	4.329	-23.266**	4.226
% Male Students	-27.203*	11.613	-24.163*	11.347	-25.931*	11.089	-27.053*	10.723
Teacher Retention Rate			24.983**	6.617	22.921**	6.486	14.527*	6.567
Student-to-Teacher Ratio					-1.162**	.319	-1.080**	.309
Overall Teaching Conditions Composite							12.490**	2.909
R ²	0.39		0.43		0.45		0.49	

* $p < .05$. ** $p < .01$.

Algebra I EOC Achievement by Overall Composite

High School Results. Table 2.3C presents information from the OLS model (1) where the outcome variable is the high school student performance on the Algebra I EOC assessment and teaching conditions is represented as a composite measure across all eight constructs (See Appendix B for calculations).

Model 2.3C. Model Summary Explaining High School Student Algebra I EOC Achievement by Overall Teaching Conditions Composite (N=262)

Variable	Model 1		Model 2		Model 3		Model 4	
	B	SE(B)	B	SE(B)	B	SE(B)	B	SE(B)
Intercept	-31.478	33.742	-46.415	33.913	-43.484	34.053	-110.79**	36.359
membership	0.017**	.005	0.015**	.005	0.011	.006	0.012*	.006
attendance	95.446**	31.205	86.256**	31.042	75.903*	32.825	83.005**	31.311
% Free-and-Reduced Lunch Students	-23.734**	8.752	-20.980*	8.716	-21.355*	8.726	-12.224	8.605
% Minority Students	-10.532	6.467	-7.828	6.487	-5.799	6.816	-6.739	6.495
% Male Students	-32.678*	14.214	-26.668	14.264	-23.059	14.742	-19.903	14.061
Teacher Retention Rate			24.146*	10.492	22.840*	10.580	18.439	10.133
Student-to-Teacher Ratio					0.522	.537	0.609	.512
Overall Teaching Conditions Composite							17.930**	4.378
R ²	0.41		0.43		0.43		0.49	

* $p < .05$. ** $p < .01$.

Free-and-Reduced Lunch Student Reading Achievement by Overall Composite

Elementary School Results. Table 3.1C presents information from the OLS model (1) where the outcome variable is the elementary school free-and-reduced lunch student performance on the K-PREP Reading assessment and teaching conditions is represented as a composite measure across all eight constructs (See Appendix B for calculations).

Model 3.1C. Model Summary Explaining Elementary School Free-and-Reduced Lunch Student Reading Achievement by Overall Teaching Conditions Composite (N=)

Variable	Model 1		Model 2		Model 3	
	B	SE(B)	B	SE(B)	B	SE(B)
Intercept	58.446**	1.659	52.649**	3.712	-0.496	6.726
% Free-and-Reduced Lunch Students	-9.249**	2.565	-6.937**	2.525	-3.342	2.379
% Minority Students	-25.475**	1.900	-21.06**	1.993	-18.06**	1.881
Average Teacher Experience			0.511*	.218	0.472*	.202
% Beginning Teachers			-20.92**	6.157	-16.29**	5.745
Overall Teaching Conditions Composite					15.730**	1.709
R ²	0.33		0.37		0.46	

* $p < .05$. ** $p < .01$.

Free-and-Reduced Lunch Reading Achievement by Overall Composite

Middle School Results. Table 1.2C presents information from the OLS model (1) where the outcome variable is the middle school Free-and-Reduced Lunch student performance on the K-PREP Reading assessment and teaching conditions is represented as a composite measure across all eight constructs (See Appendix B for calculations).

Model 3.2C. Model Summary Explaining Middle Free-and-Reduced Lunch Student Reading Achievement by Overall Teaching Conditions Composite (N=537)

Variable	Model 1		Model 2		Model 3		Model 4	
	B	SE(B)	B	SE(B)	B	SE(B)	B	SE(B)
Intercept	-25.566	37.554	-27.888	36.489	-55.648	36.540	-70.844*	35.649
attendance	101.713**	38.883	92.264*	37.555	132.804* *	38.473	115.463* *	37.572
% Minority Students	-35.762**	3.034	30.362**	3.132	29.740**	3.069	-26.323**	3.092
% Male Students	-29.304**	9.808	25.906**	9.466	26.731**	9.261	-26.686**	8.986
% Male Teachers			-9.466	5.407	-6.063	5.375	-4.747	5.226
Average Teacher Experience			0.939**	.227	1.009**	.223	0.901**	.218
Student-to-Teacher Ratio					-0.777**	.219	-0.646**	.215
Overall Teaching Conditions Composite							9.458**	2.310
R ²	0.37		0.42		0.44		0.48	
F for Change in R ²								

* $p < .05$. ** $p < .01$.

Free-and-Reduced Lunch English II EOC Achievement by Overall Composite

High School Results. Table 1.3C presents information from the OLS model (1) where the outcome variable is the high school Free-and-Reduced Lunch student performance on the K-PREP English II EOC assessment and teaching conditions is represented as a composite measure across all eight constructs (See Appendix B for calculations).

Model 3.3C. Model Summary Explaining High Free-and-Reduced Lunch Student English II EOC Achievement by Overall Teaching Conditions Composite (N=219)

Variable	Model 1		Model 2		Model 3		Model 4	
	B	SE(B)	B	SE(B)	B	SE(B)	B	SE(B)
Intercept	-71.745**	19.189	-73.67**	17.715	-82.61**	21.422	-118.21**	21.697
attendance	127.893**	20.681	106.12**	19.408	110.07**	20.142	106.21**	19.194
Average Teacher Experience			1.846**	.297	1.842**	.297	1.597**	.287
Average Teacher Salary					0.104	.140	0.098	.133
Overall Teaching Conditions Composite							13.874**	2.882
R ²	0.15		0.28		0.28		0.35	

* $p < .05$. ** $p < .01$.

Free-and-Reduced Lunch Math Achievement by Overall Composite

Elementary School Results. Table 2.1C presents information from the OLS model (1) where the outcome variable is the elementary Free-and-Reduced Lunch student performance on the K-PREP Math assessment and teaching conditions is represented as a composite measure across all eight constructs (See Appendix B for calculations).

Model 4.1C. Model Summary Explaining Elementary Free-and-Reduced Lunch Student Math Achievement by Overall Teaching Conditions Composite (N=535)

Variable	Model 1		Model 2		Model 3	
	B	SE(B)	B	SE(B)	B	SE(B)
Intercept	-121.397*	47.316	-95.313*	46.317	-106.44*	43.134
attendance	175.795**	49.714	152.25**	48.597	95.331*	45.669
% Minority Students	-21.608**	2.280	-16.88**	2.382	-11.32**	2.300
% Beginning Teachers			-36.5**	6.651	-30.12**	6.231
Overall Teaching Conditions Composite					19.936**	2.192
R ²	0.15		0.2		0.31	

* $p < .05$. ** $p < .01$.

Free-and-Reduced Lunch Math Achievement by Overall Composite

Middle School Results. Table 2.2C presents information from the OLS model (1) where the outcome variable is the middle school Free-and-Reduced Lunch student performance on the K-PREP Math assessment and teaching conditions is represented as a composite measure across all eight constructs (See Appendix B for calculations).

Model 4.2C. Model Summary Explaining Middle School Free-and-Reduced Lunch Student Math Achievement by Overall Teaching Conditions Composite (N=256)

Variable	Model 1		Model 2		Model 3		Model 4	
	B	SE(B)	B	SE(B)	B	SE(B)	B	SE(B)
Intercept	-144.456**	47.097	-156.4**	46.269	-181.1**	46.384	-190.96**	45.307
attendance	214.532**	48.719	206.18**	47.788	243.08**	48.778	217.68**	48.049
% Minority Students	-28.838**	3.762	-25.99**	3.778	-25.11**	3.736	-21.380**	3.777
% Male Students	-30.600*	12.077	-28.054*	11.854	-28.302*	11.682	-29.260*	11.394
Teacher Retention Rate			22.504**	6.603	24.901**	6.560	18.615**	6.615
Student-to-Teacher Ratio					-0.789**	.272	-0.607*	.269
Overall Teaching Conditions Composite							11.377**	3.049
R ²	0.24		0.28		0.3		0.34	

* $p < .05$. ** $p < .01$.

Free-and-Reduced Lunch Algebra I EOC Achievement by Overall Composite

High School Results. Table 2.3C presents information from the OLS model (1) where the outcome variable is the high school Free-and-Reduced Lunch student performance on the Algebra I EOC assessment and teaching conditions is represented as a composite measure across all eight constructs (See Appendix B for calculations).

Model 4.3C. Model Summary Explaining High School Free-and-Reduced Lunch Student Algebra I EOC Achievement by Overall Teaching Conditions Composite (N=231)

Variable	Model 1		Model 2	
	B	SE(B)	B	SE(B)
Intercept	-84.762**	18.513	-155.5**	20.311
membership	0.007**	.002	0.008**	.002
attendance	115.474**	20.374	114.78**	18.783
Overall Teaching Conditions Composite			22.925**	3.568
R ²	0.21		0.33	

* $p < .05$. ** $p < .01$.

Reading Achievement by Construct Averages

In the following tables, Model 1 represents the baseline model prior to considering teaching conditions. In each case, Model 1 includes all statistically significant student, teacher, and school level variables. The coefficients for each of the individual construct average models are presented in the lower portion of the table.

Elementary School Results. Table 5.1C presents information from the OLS model (1) where the outcome variable is the elementary school student performance on the K-PREP Reading assessment and teaching conditions are represented individually by each of the eight construct averages (See Appendix B for calculations).

Model 5.1C. Model Summary Explaining Elementary School Student Reading Achievement by Teaching Conditions Construct Averages (N=543)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Student, Teacher, School Variables									
Intercept	75.85**	19.62**	45.48**	35.20**	24.21**	40.82**	40.84**	36.02**	42.68**
% Free-and-Reduced Lunch Students	-34.21**	-23.88**	-31.85**	-32.99**	-33.08**	-32.12**	-33.37**	-30.77**	-34.18**
% Minority Students	-17.78**	-14.62**	-16.41**	-15.80**	-15.16**	-15.51**	-16.84**	-13.96**	-14.27**
Average Teacher Experience	0.64**	0.48*	0.61**	0.73**	0.59**	0.59**	0.58**	0.64**	0.65**
% Beginning Teachers	-19.81**	-14.55**	-16.47**	-16.32**	-17.13**	-16.82**	-17.23**	-13.40*	-17.33**
Teaching Condition Construct Averages									
Community Support & Involvement		15.67**							
Teacher Leadership			8.99**						
Facilities & Resources				11.60**					
Instructional Practices & Support					15.63**				
School Leadership						10.29**			
Professional Development							11.03**		
Managing Student Conduct								11.24**	
Use of Time									10.76**
R ²	0.57	0.64	0.61	0.61	0.62	0.61	0.61	0.63	0.62

* $p < .05$. ** $p < .01$.

Reading Achievement by Construct Averages

Middle School Results. Table 5.2C presents information from the OLS model (1) where the outcome variable is the middle school student performance on the K-PREP Reading assessment and teaching conditions are represented individually by each of the eight construct averages (See Appendix B for calculations).

Model 5.2C. Model Summary Explaining Middle School Student Reading Achievement by Teaching Conditions Construct Averages (N=262)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Student, Teacher, School Variables									
Intercept	-22.44	-35.42	-25.26	-32.29	-25.32	-27.18	-33.27	-25.92	-20.95
attendance	116.72**	87.05*	100.19*	101.64*	84.32	103.77*	111.43*	97.66*	94.02*
% Free-and-Reduced Lunch Students	-24.62**	-21.46**	-25.08**	-24.24**	-25.85**	-25.22**	-25.03**	-25.63**	-25.30**
% Minority Students	-24.92**	-19.44**	-22.61**	-23.62**	-21.65**	-22.70**	-23.61**	-20.27**	-22.84**
% Male Students	-25.00**	-21.43**	-26.06**	-23.79**	-25.58**	-26.51**	-25.39**	-23.37**	-24.22**
Average Teacher Experience	1.18**	0.96**	1.12**	1.12**	1.11**	1.11**	1.10**	1.09**	1.07**
Student-to-Teacher Ratio	-0.75**	-0.53**	-0.65**	-0.66**	-0.63**	-0.68**	-0.71**	-0.62**	-0.55**
Teaching Condition Construct Averages									
Community Support & Involvement		11.47**							
Teacher Leadership			5.67**						
Facilities & Resources				6.82**					
Instructional Practices & Support					10.17**				
School Leadership						5.39**			
Professional Development							5.22*		
Managing Student Conduct								6.30**	
Use of Time									5.90**
R ²	0.53	0.59	0.55	0.55	0.56	0.55	0.54	0.56	0.55

* $p < .05$. ** $p < .01$.

Reading Achievement by Construct Averages

High School Results. Table 5.3C presents information from the OLS model (1) where the outcome variable is the high school student performance on the English II EOC assessment and teaching conditions are represented individually by each of the eight construct averages (See Appendix B for calculations).

Model 5.3C. Model Summary Explaining High School Student Reading Achievement by Teaching Conditions Construct Averages (N=157)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Student, Teacher, School Variables									
Intercept	-129.61**	-141.2**	-121.7**	-125.77**	-127.49**	-124.35**	-126.77**	-129.78**	-122.96**
attendance	190.33**	186.22**	190.02**	190.81**	191.13**	190.71**	190.48**	190.33**	189.16**
% Free-and-Reduced Lunch Students	-16.71**	-14.19*	-17.52**	-17.12**	-16.78**	-17.30**	-16.80**	-16.69**	-17.13**
% Minority Students	-21.49**	-21.38**	-20.89**	-21.47**	-21.44**	-21.20**	-21.36**	-21.49**	-21.55**
% Beginning Teachers	-38.73**	-35.03**	-40.54**	-39.62**	-39.09**	-40.27**	-39.72**	-38.68**	-39.70**
Average Teacher Salary	0.51*	0.50*	0.52*	0.52*	0.52*	0.51*	0.52*	0.51*	0.54*
Teaching Condition Construct Averages									
Community Support & Involvement		4.73							
Teacher Leadership			-2.36						
Facilities & Resources				-1.33					
Instructional Practices & Support					-0.97				
School Leadership						-1.59			
Professional Development							-1.04		
Managing Student Conduct								0.05	
Use of Time									-2.15
R ²	0.68	0.69	0.69	0.68	0.68	0.68	0.68	0.68	0.69

* $p < .05$. ** $p < .01$.

Math Achievement by Construct Averages

Elementary School Results. Table 6.1C presents information from the OLS model (1) where the outcome variable is the elementary school student performance on the K-PREP MATH assessment and teaching conditions are represented individually by each of the eight construct averages (See Appendix B for calculations).

Model 6.1C. Model Summary Explaining Elementary School Student Math Achievement by Teaching Conditions Construct Averages (N=543)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Student, Teacher, School Variables									
Intercept	-89.78	-150.41**	-120.16*	-113.37*	-138.62**	-127.86*	-157.62**	-121.28*	-133.09*
attendance	174.19**	159.42**	162.53**	138.83*	147.69**	162.59**	188.18**	151.44**	169.37**
% Free-and-Reduced Lunch Students	-28.59**	-15.69**	-25.82**	-28.54**	-28.02**	-26.09**	-26.56**	-24.94**	-28.76**
% Minority Students	-14.48**	-9.69**	-12.29**	-11.18**	-10.08**	-10.96**	-13.10**	-8.89**	-9.31**
% Beginning Teachers	-38.13**	-28.20**	-32.85**	-35.02**	-33.21**	-32.90**	-32.71**	-29.51**	-34.69**
Teaching Condition Construct Averages									
Community Support & Involvement		20.03**							
Teacher Leadership			12.13**						
Facilities & Resources				17.13**					
Instructional Practices & Support					22.27**				
School Leadership						14.18**			
Professional Development							16.61**		
Managing Student Conduct								15.14**	
Use of Time									15.62**
R ²	0.4	0.50	0.46	0.47	0.49	0.47	0.47	0.49	0.48

* $p < .05$. ** $p < .01$.

Math Achievement by Construct Averages

Middle School Results. Table 6.2C presents information from the OLS model (1) where the outcome variable is the middle school student performance on the K-PREP Math assessment and teaching conditions are represented individually by each of the eight construct averages (See Appendix B for calculations).

Model 6.2C. Model Summary Explaining Middle School Student Math Achievement by Teaching Conditions Construct Averages (N=257)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Student, Teacher, School Variables									
Intercept	-135.24*	-149.82**	-139.80*	-151.54**	-141.98*	-143.41*	-153.92**	-140.67*	-137.86*
membership	0.01	0.01**	0.01*	0.01*	0.01**	0.01*	0.01*	0.01**	0.01*
attendance	226.09**	193.70**	207.34**	208.13**	187.79**	215.01**	222.06**	208.95**	201.16**
% Free-and-Reduced Lunch Students	-29.75**	-24.99**	-29.66**	-28.31**	-30.45**	-29.69**	-29.76**	-30.21**	-29.70**
% Minority Students	-25.81**	-20.79**	-24.43**	-25.73**	-23.29**	-24.57**	-25.10**	-22.10**	-24.24**
% Male Students	-25.93*	-23.13*	-28.65**	-25.23*	-28.24**	-28.82**	-27.68*	-25.10*	-25.67*
Teacher Retention Rate	22.92**	10.42	17.25**	17.87**	16.37*	18.24**	17.45**	16.41*	16.34*
Student-to-Teacher Ratio	-1.16**	-0.97**	-1.12**	-1.12**	-1.10**	-1.16**	-1.17**	-1.11**	-0.96**
Teaching Condition Construct Averages									
Community Support & Involvement		14.74**							
Teacher Leadership			8.15**						
Facilities & Resources				10.41**					
Instructional Practices & Support					14.47**				
School Leadership						6.92**			
Professional Development							8.56**		
Managing Student Conduct								7.64**	
Use of Time									8.78**
R ²	0.45	0.52	0.48	0.48	0.49	0.47	0.47	0.49	0.48

* $p < .05$. ** $p < .01$.

Math Achievement by Construct Averages

High School Results. Table 6.3C presents information from the OLS model (1) where the outcome variable is the high school student performance on the Algebra I EOC assessment and teaching conditions are represented individually by each of the eight construct averages (See Appendix B for calculations).

Model 6.3C. Model Summary Explaining High School Student Math Achievement by Teaching Conditions Construct Averages (N=162)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Student, Teacher, School Variables									
Intercept	-43.48	-105.08**	-81.52*	-93.57*	-115.48**	-90.10*	-96.57**	-96.88**	-110.37**
membership	0.01	0.01*	0.01*	0.01	0.01*	0.01*	0.01	0.01	0.01*
attendance	75.90*	73.67*	78.36*	75.61*	79.51*	80.77*	84.84**	87.88**	90.06**
% Free-and-Reduced Lunch Students	-21.36*	-6.73	-15.62	-14.97	-15.69	-14.25	-16.95*	-12.91	-14.59
% Minority Students	-5.8	-6.33	-7.97	-5.76	-7.13	-7.34	-7.34	-4.3	-5.87
% Male Students	-23.06	-16.93	-22.11	-17.27	-21.02	-21.77	-22.57	-20.65	-21.5
Teacher Retention Rate	22.84*	16.48	20.38	20.32	18.83	20.91*	18.54	19.18	18.85
Student-to-Teacher Ratio	0.52	0.55	0.56	0.72	0.45	0.43	0.61	0.63	0.76
Teaching Condition Construct Averages									
Community Support & Involvement		18.14**							
Teacher Leadership			10.70**						
Facilities & Resources				13.25**					
Instructional Practices & Support					21.31**				
School Leadership						12.65**			
Professional Development							14.76**		
Managing Student Conduct								12.48**	
Use of Time									15.56**
R ²	0.43	0.50	0.46	0.46	0.48	0.47	0.48	0.48	0.49

* $p < .05$. ** $p < .01$.

Free-and-Reduced Lunch Reading Achievement by Construct Averages

Elementary School Results. Table 7.1C presents information from the OLS model (1) where the outcome variable is the elementary school free-and-reduced student performance on the K-PREP Reading assessment and teaching conditions are represented individually by each of the eight construct averages (See Appendix B for calculations).

Model 7.1C. Model Summary Explaining Elementary School Free-and-Reduced Student Reading Achievement by Teaching Conditions Construct Averages (N=537)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Student, Teacher, School Variables									
Intercept	52.65**	-7.05	19.86**	9.97	-4.53	14.62*	13.98*	6.89	17.09**
% Free-and-Reduced Lunch Students	-6.94**	4.23	-4.21	-5.48*	-5.47*	-4.44	-5.80*	-2.73	-6.63**
% Minority Students	-21.06**	-17.90**	-19.75**	-19.14**	-18.38**	-18.79**	-20.16**	-17.02**	-17.52**
Average Teacher Experience	0.51*	0.35	0.48*	0.59**	0.46*	0.46*	0.44*	0.52*	0.52*
% Beginning Teachers	-20.92**	-15.67**	-17.48**	-17.51**	-18.24**	-17.82**	-18.25**	-13.99*	-18.48**
Teaching Condition Construct Averages									
Community Support & Involvement		16.59**							
Teacher Leadership			9.67**						
Facilities & Resources				12.18**					
Instructional Practices & Support					17.26**				
School Leadership						11.12**			
Professional Development							12.15**		
Managing Student Conduct								12.87**	
Use of Time									11.50**
R ²	0.37	0.47	0.43	0.42	0.45	0.44	0.43	0.47	0.44

* $p < .05$. ** $p < .01$.

Free-and-Reduced Reading Achievement by Construct Averages

Middle School Results. Table 7.2C presents information from the OLS model (1) where the outcome variable is the middle school free-and-reduced student performance on the K-PREP Reading assessment and teaching conditions are represented individually by each of the eight construct averages (See Appendix B for calculations).

Model 7.2C. Model Summary Explaining Middle School Free-and-Reduced Student Reading Achievement by Teaching Conditions Construct Averages (N=261)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Student, Teacher, School Variables									
Intercept	-55.65	-56.54	-66.42	-63.4	-72.26*	-68.74	-73.18*	-70.97*	-61.15
attendance	132.80**	95.67*	123.31**	112.73**	113.21**	127.19**	132.47**	124.61**	112.02**
% Free-and-Reduced Lunch Students	-29.74**	-24.78**	-27.66**	-28.07**	-26.83**	-27.70**	-28.49**	-25.28**	-27.36**
% Minority Students	-26.73**	-23.47**	-28.24**	-25.14**	-27.76**	-28.65**	-27.36**	-25.42**	-25.79**
% Male Students	-6.06	-3.38	-4.82	-5.87	-3.96	-4.68	-5.36	-4.74	-6.98
Average Teacher Experience	1.01**	0.82**	0.96**	0.95**	0.96**	0.95**	0.93**	0.93**	0.87**
Student-to-Teacher Ratio	-0.78**	-0.67**	-0.70**	-0.67**	-0.68**	-0.72**	-0.75**	-0.67**	-0.53*
Teaching Condition Construct Averages									
Community Support & Involvement		10.81**							
Teacher Leadership			6.07**						
Facilities & Resources				7.53**					
Instructional Practices & Support					10.37**				
School Leadership						5.72**			
Professional Development							5.83**		
Managing Student Conduct								6.60**	
Use of Time									7.36**
R ²	0.44	0.50	0.47	0.46	0.48	0.46	0.46	0.48	0.48

* $p < .05$. ** $p < .01$.

Free-and-Reduced Reading Achievement by Construct Averages

High School Results. Table 7.3C presents information from the OLS model (1) where the outcome variable is the high school free-and-reduced lunch student performance on the English II EOC assessment and teaching conditions are represented individually by each of the eight construct averages (See Appendix B for calculations).

Model 7.3C. Model Summary Explaining High School Free-and-Reduced Student Reading Achievement by Teaching Conditions Construct Averages (N=219)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Student, Teacher, School Variables									
Intercept	-82.60**	-93.36**	-104.30**	-120.52**	-129.39**	-108.85**	-111.53**	-106.57**	-105.83**
attendance	110.07**	77.19**	107.25**	111.44**	109.07**	106.32**	114.58**	106.53**	112.59**
Average Teacher Experience	1.84**	1.39**	1.74**	1.68**	1.70**	1.70**	1.72**	1.58**	1.65**
Average Teacher Salary	0.1	0.06	0.05	0.15	0.12	0.11	0.08	0.15	0.09
Teaching Condition Construct Averages									
Community Support & Involvement		16.35**							
Teacher Leadership			9.21**						
Facilities & Resources				11.32**					
Instructional Practices & Support					15.44**				
School Leadership						10.06**			
Professional Development							9.09**		
Managing Student Conduct								9.54**	
Use of Time									8.07**
R ²	0.28	0.40	0.33	0.33	0.34	0.33	0.31	0.35	0.32

* $p < .05$. ** $p < .01$.

Free-and-Reduced Math Achievement by Construct Averages

Elementary School Results. Table 8.1C presents information from the OLS model (1) where the outcome variable is the elementary school free-and-reduced lunch student performance on the K-PREP Math assessment and teaching conditions are represented individually by each of the eight construct averages (See Appendix B for calculations).

Model 8.1C. Model Summary Explaining Elementary School Free-and-Reduced Student Math Achievement by Teaching Conditions Construct Averages (N=535)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Student, Teacher, School Variables									
Intercept	-95.31*	-36.38	-93.58*	-115.33**	-136.37**	-102.44*	-140.90**	-84.18	-135.35**
attendance	152.25**	31.79	110.85*	114.23*	114.80*	111.28*	144.24**	85.19	142.51**
% Minority Students	-16.88**	-9.64**	-14.07**	-13.61**	-12.24**	-12.80**	-14.86**	-10.11**	-11.71**
% Beginning Teachers	-36.50**	-27.86**	-31.82**	-34.12**	-32.33**	-31.95**	-31.65**	-28.55**	-33.78**
Teaching Condition Construct Averages									
Community Support & Involvement		16.68**							
Teacher Leadership			11.51**						
Facilities & Resources				16.87**					
Instructional Practices & Support					23.23**				
School Leadership						13.77**			
Professional Development							16.61**		
Managing Student Conduct								15.73**	
Use of Time									16.11**
R ²	0.2	0.29	0.26	0.27	0.31	0.27	0.28	0.31	0.30

* $p < .05$. ** $p < .01$.

Free-and-Reduced Math Achievement by Construct Averages

Middle School Results. Table 8.2C presents information from the OLS model (1) where the outcome variable is the middle school student performance on the K-PREP Math assessment and teaching conditions are represented individually by each of the eight construct averages (See Appendix B for calculations).

Model 8.2C. Model Summary Explaining Middle School Free-and-Reduced Student Math Achievement by Teaching Conditions Construct Averages (N=256)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Student, Teacher, School Variables									
Intercept	-181.13**	-167.77**	-186.80**	-185.53**	-194.99**	-189.06**	-199.58**	-191.88**	-183.78**
attendance	243.08**	188.53**	228.17**	214.10**	213.66**	234.99**	239.42**	231.22**	217.79**
% Minority Students	-25.10**	-19.38**	-23.08**	-23.39**	-21.71**	-23.32**	-23.60**	-20.53**	-22.47**
% Male Students	-28.30*	-25.51*	-30.72**	-27.13*	-30.48**	-30.59**	-29.92*	-27.55*	-28.10*
Teacher Retention Rate	24.90**	14.40*	20.92**	21.59**	19.92**	21.97**	20.62**	19.85**	19.64**
Student-to-Teacher Ratio	-0.79**	-0.62*	-0.68*	-0.65*	-0.63*	-0.72**	-0.73**	-0.64*	-0.51
Teaching Condition Construct Averages									
Community Support & Involvement		13.48**							
Teacher Leadership			6.98**						
Facilities & Resources				9.62**					
Instructional Practices & Support					13.48**				
School Leadership						5.48*			
Professional Development							7.99**		
Managing Student Conduct								7.23**	
Use of Time									8.55**
R ²	0.3	0.36	0.32	0.32	0.34	0.31	0.32	0.33	0.33

* $p < .05$. ** $p < .01$.

Free-and-Reduced Math Achievement by Construct Averages

High School Results. Table 8.3C presents information from the OLS model (1) where the outcome variable is the high school free-and-reduced lunch student performance on the Algebra I EOC assessment and teaching conditions are represented individually by each of the eight construct averages (See Appendix B for calculations).

Model 8.3C. Model Summary Explaining High School Free-and-Reduced Student Algebra I Achievement by Teaching Conditions Construct Averages (N=231)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Student, Teacher, School Variables									
Intercept	-84.76**	-119.1**	-134.96**	-145.20**	-170.71**	-137.98**	-152.11**	-128.74**	-144.94**
membership	0.01**	0.01**	0.01**	0.01**	0.01**	0.01**	0.01**	0.01**	0.01**
attendance	115.47**	88.50**	118.30**	117.25**	111.87**	112.08**	126.65**	114.13**	125.94**
Teaching Condition Construct Averages									
Community Support & Involvement		19.75**							
Teacher Leadership			15.32**						
Facilities & Resources				18.08**					
Instructional Practices & Support					27.81**				
School Leadership						17.85**			
Professional Development							18.74**		
Managing Student Conduct								15.00**	
Use of Time									16.16**
R ²	0.21	0.32	0.29	0.29	0.32	0.31	0.30	0.32	0.29

* $p < .05$. ** $p < .01$.

APPENDIX D

Academic Growth

Reading Growth by Overall Composite

Elementary School Results. Table 9.1D presents information from the OLS model (1) where the outcome variable is the elementary school student academic growth (percent percentage of students demonstrating typical or higher annual growth) in reading and teaching conditions is represented as a composite measure across all eight constructs (See Appendix B for calculations).

Model 9.1D. Model Summary Explaining Elementary School Student Reading Growth by Overall Teaching Conditions Composite (N=533)

Variable	Model 1		Model 2		Model 3	
	B	SE(B)	B	SE(B)	B	SE(B)
Intercept	78.198**	1.468	72.630**	3.303	38.414**	6.187
% Free-and-Reduced Lunch Students	-21.400**	2.259	-19.538**	2.242	-17.48**	2.184
% Minority Students	-14.131**	1.663	-10.600**	1.765	-8.463**	1.733
Average Teacher Experience			0.461*	.193	0.439*	.186
% Beginning Teachers			-14.262**	5.480	-10.968*	5.306
Overall Teaching Conditions Composite					10.136**	1.572
R ²	0.324		0.357		0.404	

* $p < .05$. ** $p < .01$.

Reading Growth by Overall Composite

Middle School Results. Table 9.2D presents information from the OLS model (1) where the outcome variable is the middle school student academic growth (percent percentage of students demonstrating typical or higher annual growth) in reading and teaching conditions is represented as a composite measure across all eight constructs (See Appendix B for calculations).

Model 9.2D. Model Summary Explaining Middle School Student Reading Growth by Overall Teaching Conditions Composite (N=262)

Variable	Model 1		Model 2		Model 3		Model 4	
	B	SE(B)	B	SE(B)	B	SE(B)	B	SE(B)
Intercept	65.915**	.618	55.839**	2.458	60.658**	3.531	43.649**	7.414
% Minority Students	-18.985**	2.632	-15.004**	2.719	-14.989**	2.675	-13.082**	2.745
Average Teacher Experience			0.802**	.190	0.776**	.188	0.707**	.187
Student-to-Teacher Ratio					-0.442*	.184	-0.377*	.183
Students per computer					1.491**	.534	1.549**	.529
Overall Teaching Conditions Composite							5.194**	1.997
R ²	0.167		0.22		0.253		0.273	

* $p < .05$. ** $p < .01$.

Math Growth by Overall Composite

Elementary School Results. Table 10.1D presents information from the OLS model (1) where the outcome variable is the elementary school student academic growth (percent percentage of students demonstrating typical or higher annual growth) in math and teaching conditions is represented as a composite measure across all eight constructs (See Appendix B for calculations).

Model 10.1D. Model Summary Explaining Elementary School Student Math Growth by Overall Teaching Conditions Composite (N=533)

Variable	Model 1		Model 2		Model 3	
	B	SE(B)	B	SE(B)	B	SE(B)
Intercept	-72.601	60.673	-60.623	59.557	-100.091	57.511
attendance	149.654*	62.018	139.558*	60.859	127.941*	58.486
% Free-and-Reduced Lunch Students	-11.986**	4.176	-10.854**	4.103	-8.279*	3.960
% Minority Students	-12.652**	2.592	-8.938**	2.662	-5.509*	2.608
% Beginning Teachers			-30.471**	6.492	-25.17**	6.286
Overall Teaching Conditions Composite					14.913**	2.218
R ²	0.14		0.175		0.24	

* $p < .05$. ** $p < .01$.

Math Growth by Overall Composite

Middle School Results. Table 10.2D presents information from the OLS model (1) where the outcome variable is the middle school student academic growth (percent percentage of students demonstrating typical or higher annual growth) in math and teaching conditions is represented as a composite measure across all eight constructs (See Appendix B for calculations).

Model 10.2D. Model Summary Explaining Middle School Student Math Growth by Overall Teaching Conditions Composite (N=255)

Variable	Model 1		Model 2		Model 3	
	B	SE(B)	B	SE(B)	B	SE(B)
Intercept	-183.832**	43.476	-206.156**	44.076	-226.274**	43.209
attendance	257.293**	46.111	257.387**	45.429	241.951**	44.392
% Minority Students	-17.461**	3.714	-23.503**	4.472	-17.675**	4.606
Average Teacher Salary			0.431*	.191	0.381*	.186
Number of Parents on School Council			0.358*	.178	0.323	.174
Overall Teaching Conditions Composite					11.514**	2.977
R ²	0.151		0.178		0.221	

* $p < .05$. ** $p < .01$.

Reading Growth by Construct Averages

In the following tables, Model 1 represents the baseline model prior to considering teaching conditions. In each case, Model 1 includes all statistically significant student, teacher, and school level variables. The coefficients for each of the individual construct average models are presented in the lower portion of the table.

Elementary School Results. Table 11.1D presents information from the OLS model (1) where the outcome variable is the elementary school student academic growth in reading (percent percentage of students demonstrating typical or higher annual growth) and teaching conditions are represented individually by each of the eight construct averages (See Appendix B for calculations).

Model 11.1D. Model Summary Explaining Elementary School Student Reading Growth by Teaching Conditions Construct Averages (N=533)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Student, Teacher, School Variables									
Intercept	72.63**	34.63**	50.86**	44.36**	40.82**	44.58**	51.51**	39.98**	52.78**
% Minority Students	-19.54**	-12.65**	-17.90**	-18.74**	-18.89**	-17.96**	-19.09**	-16.80**	-19.55**
Average Teacher Experience	-10.60**	-8.43**	-9.59**	-9.21**	-8.95**	-8.74**	-10.00**	-7.45**	-8.46**
Student-to-Teacher Ratio	0.46*	0.36	0.44*	0.52**	0.44*	0.42*	0.43*	0.46*	0.47*
Students per computer	-14.26**	-10.50*	-11.80*	-11.79*	-12.51*	-11.80*	-12.64*	-8.86	-12.69*
Teaching Condition Construct Averages									
Community Support & Involvement		10.55**							
Teacher Leadership			6.44**						
Facilities & Resources				8.07**					
Instructional Practices & Support					9.60**				
School Leadership						8.23**			
Professional Development							6.65**		
Managing Student Conduct								9.21**	
Use of Time									6.40**
R ²	0.36	0.41	0.39	0.39	0.39	0.40	0.38	0.42	0.38

* $p < .05$. ** $p < .01$.

Reading Growth by Construct Averages

Middle School Results. Table 11.2D presents information from the OLS model (1) where the outcome variable is the middle school student academic growth in reading (percent percentage of students demonstrating typical or higher annual growth) and teaching conditions are represented individually by each of the eight construct averages (See Appendix B for calculations).

Model 11.2D. Model Summary Explaining Middle School Student Reading Growth by Teaching Conditions Construct Averages (N=)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Student, Teacher, School Variables									
Intercept	60.66**	36.23**	50.70**	44.97**	42.84**	51.74**	55.93**	46.30**	50.24**
% Minority Students	-14.99**	-11.37**	-13.85**	-14.24**	-13.46**	-13.94**	-14.62**	-11.99**	-14.03**
Average Teacher Experience	0.78**	0.61**	0.75**	0.72**	0.74**	0.74**	0.75**	0.71**	0.71**
Student-to-Teacher Ratio	-0.44*	-0.37*	-0.40*	-0.42*	-0.40*	-0.41*	-0.43*	-0.36*	-0.35
Students per computer	1.49**	1.34**	1.52**	1.71**	1.55**	1.52**	1.50**	1.50**	1.57**
Teaching Condition Construct Averages									
Community Support & Involvement		8.07**							
Teacher Leadership			2.97						
Facilities & Resources				4.74*					
Instructional Practices & Support					5.31*				
School Leadership						2.66			
Professional Development							1.51		
Managing Student Conduct								4.29**	
Use of Time									3.15
R ²	0.25	0.31	0.26	0.27	0.27	0.26	0.26	0.28	0.26

* $p < .05$. ** $p < .01$.

Math Growth by Construct Averages

In the following tables, Model 1 represents the baseline model prior to considering teaching conditions. In each case, Model 1 includes all statistically significant student, teacher, and school level variables. The coefficients for each of the individual construct average models are presented in the lower portion of the table.

Elementary School Results. Table 11.1D presents information from the OLS model (1) where the outcome variable is the elementary school student academic growth in math (percent percentage of students demonstrating typical or higher annual growth) and teaching conditions are represented individually by each of the eight construct averages (See Appendix B for calculations).

Model 12.1D. Model Summary Explaining Elementary School Student Math Growth by Teaching Conditions Construct Averages (N=533)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Student, Teacher, School Variables									
Intercept	-60.62	-107.2	-83.36	-80.97	-92.33	-90.81	-107.25	-85.46	-90.1
attendance	139.56*	127.40*	131.61*	110.11	122.42*	131.61*	149.57*	121.82*	136.76*
% Free-and-Reduced Lunch Students	-10.85**	-0.95	-8.89*	-10.88**	-10.57**	-9.02*	-9.56*	-8.09*	-11.03**
% Minority Students	-8.94**	-5.17*	-7.33**	-6.15*	-6.06*	-6.21*	-7.97**	-4.55	-5.42*
% Beginning Teachers	-30.47**	-22.72**	-26.60**	-27.81**	-27.32**	-26.45**	-26.75**	-23.57**	-28.25**
Teaching Condition Construct Averages									
Community Support & Involvement		15.62**							
Teacher Leadership			8.87**						
Facilities & Resources				14.49**					
Instructional Practices & Support					14.46**				
School Leadership						10.91**			
Professional Development							11.31**		
Managing Student Conduct								11.91**	
Use of Time									10.50**
R ²	0.17	0.25	0.21	0.23	0.22	0.23	0.22	0.24	0.22

* $p < .05$. ** $p < .01$.

Math Growth by Construct Averages

Middle School Results. Table 12.2D presents information from the OLS model (1) where the outcome variable is the middle school student academic growth in math (percent percentage of students demonstrating typical or higher annual growth) and teaching conditions are represented individually by each of the eight construct averages (See Appendix B for calculations).

Model 12.2D. Model Summary Explaining Middle School Student Math Growth by Teaching Conditions Construct Averages (N=255)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Student, Teacher, School Variables									
Intercept	-206.16**	-197.27**	-218.79**	-223.84**	-226.14**	-221.37**	-232.22**	-223.95**	-219.33**
attendance	257.39**	210.49**	249.39**	235.95**	237.71**	253.62**	258.20**	251.83**	248.77**
% Minority Students	-23.50**	-14.58**	-20.13**	-20.54**	-18.78**	-20.77**	-19.95**	-17.16**	-19.62**
Average Teacher Salary	0.43*	0.33	0.40*	0.40*	0.39*	0.43*	0.37	0.40*	0.38*
Number of Parents on School Council	0.36*	0.26	0.34	0.36*	0.33	0.33	0.33	0.31	0.37*
Teaching Condition Construct Averages									
Community Support & Involvement		12.76**							
Teacher Leadership			6.69**						
Facilities & Resources				11.86**					
Instructional Practices & Support					12.25**				
School Leadership						5.74*			
Professional Development							8.95**		
Managing Student Conduct								7.58**	
Use of Time									7.64**
R ²	0.19	0.26	0.21	0.24	0.23	0.21	0.22	0.23	0.22

* $p < .05$. ** $p < .01$.

APPENDIX E**Teacher Retention****Teacher Retention by Overall Composite**

Elementary School Results. Table 13.1E presents information from the OLS model (1) where the outcome variable is the elementary school teacher retention and teaching conditions are represented as a composite measure across all eight constructs (See Appendix B for calculations).

Model 13.1E. Model Summary Explaining Elementary Teacher Retention by Overall Teaching Conditions Composite (N=536)

Variable	Model 1		Model 2		Model 3		Model 4	
	B	SE(B)	B	SE(B)	B	SE(B)	B	SE(B)
Intercept	0.870**	.006	0.852**	.029	0.852**	.029	0.764**	.061
% Minority Students	-0.128**	.017	-0.063**	.018	-0.063**	.018	-0.056**	.018
Average Teacher Experience			0.004*	.002	0.004*	.002	0.004*	.002
% Beginning Teachers			-0.356**	.057	-0.356**	.057	-0.346**	.057
Overall Teaching Conditions Composite							0.027	.017
R ²	0.098		0.222		0.222		0.226	

* $p < .05$. ** $p < .01$.

Teacher Retention by Overall Composite

Middle School Results. Table 13.2E presents information from the OLS model (1) where the outcome variable is the middle school teacher retention and teaching conditions are represented as a composite measure across all eight constructs (See Appendix B for calculations).

Model 13.2E. Model Summary Explaining Middle Teacher Retention by Overall Teaching Conditions Composite (N=248)

Variable	Model 1		Model 2		Model 3		Model 4	
	B	SE(B)	B	SE(B)	B	SE(B)	B	SE(B)
Intercept	0.712	.415	0.836*	.377	0.682	.378	0.527	.368
membership	0.000**	.000	0.000**	.000	0.000**	.000	0.000**	.000
attendance	0.042	.442	-0.114	.398	0.033	.398	-0.167	.388
% Minority Students	-0.183**	.037	-0.088*	.035	-0.084*	.035	-0.058	.034
Average Teacher Experience			0.008**	.003	0.007*	.003	0.007*	.003
% Beginning Teachers			-0.412**	.086	-0.405**	.085	-0.375**	.082
Students per computer					0.017*	.007	0.017**	.007
Overall Teaching Conditions Composite							0.105**	.025
R ²	0.128		0.303		0.321		0.367	

* $p < .05$. ** $p < .01$.

Teacher Retention by Overall Composite

High School Results. Table 13.3E presents information from the OLS model (1) where the outcome variable is the high school teacher retention and teaching conditions are represented as a composite measure across all eight constructs (See Appendix B for calculations).

Model 13.3E. Model Summary Explaining High Teacher Retention by Overall Teaching Conditions Composite (N=238)

Variable	Model 1		Model 2		Model 3	
	B	SE(B)	B	SE(B)	B	SE(B)
Intercept	0.929**	.012	0.929**	.012	0.896**	.084
% Minority Teachers	-0.283**	.065	-0.283**	.065	-0.283**	.065
% Beginning Teachers	-0.696**	.072	-0.696**	.072	-0.688**	.075
Overall Teaching Conditions Composite					0.01	.026

R²

* $p < .05$. ** $p < .01$.

Teacher Retention by Construct Averages

Elementary School Results. Table 14.1E presents information from the OLS model (1) where the outcome variable is elementary school teacher retention and teaching conditions are represented individually by each of the eight construct averages (See Appendix B for calculations).

Model 14.1E. Model Summary Explaining Elementary School Teacher Retention by Teaching Conditions Construct Averages (N=536)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Student, Teacher, School Variables									
Intercept	0.85**	0.78**	0.79**	0.72**	0.75**	0.78**	0.76**	0.84**	0.80**
% Minority Students	-0.06**	-0.05**	-0.06**	-0.06**	-0.06**	-0.06**	-0.06**	-0.06**	-0.06**
Average Teacher Experience	0.00*	0	0.00*	0.00*	0.00*	0.00*	0.00*	0.00*	0.00*
% Beginning Teachers	-0.36**	-0.35**	-0.35**	-0.34**	-0.35**	-0.35**	-0.35**	-0.35**	-0.35**
Teaching Condition Construct Averages									
Community Support & Involvement		0.02							
Teacher Leadership			0.02						
Facilities & Resources				0.04*					
Instructional Practices & Support					0.03				
School Leadership						0.02			
Professional Development							0.03		
Managing Student Conduct								0	
Use of Time									0.02
R ²	0.22	0.23	0.23	0.23	0.23	0.23	0.23	0.22	0.22

* $p < .05$. ** $p < .01$.

Teacher Retention by Construct Averages

Middle School Results. Table 14.2E presents information from the OLS model (1) where the outcome variable is middle school teacher retention and teaching conditions are represented individually by each of the eight construct averages (See Appendix B for calculations).

Model 14.2E. Model Summary Explaining Middle School Teacher Retention by Teaching Conditions Construct Averages (N=248)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Student, Teacher, School Variables									
Intercept	0.68	0.74*	0.54	0.58	0.53	0.51	0.42	0.58	0.59
membership	0.00**	0.00**	0.00**	0.00**	0.00**	0.00**	0.00**	0.00**	0.00**
attendance	0.03	-0.34	-0.12	-0.14	-0.18	-0.06	0.02	-0.08	-0.11
% Minority Students	-0.08*	-0.05	-0.06	-0.08*	-0.06	-0.06	-0.07*	-0.05	-0.07*
Average Teacher Experience	0.01*	0.01*	0.01*	0.01**	0.01*	0.01*	0.01*	0.01**	0.01*
% Beginning Teachers	-0.40**	-0.38**	-0.39**	-0.37**	-0.40**	-0.40**	-0.39**	-0.37**	-0.37**
Students per computer	0.02*	0.01*	0.02**	0.02**	0.02*	0.02*	0.02**	0.02*	0.02**
Teaching Condition Construct Averages									
Community Support & Involvement		0.10**							
Teacher Leadership			0.09**						
Facilities & Resources				0.07**					
Instructional Practices & Support					0.11**				
School Leadership						0.08**			
Professional Development							0.09**		
Managing Student Conduct								0.06**	
Use of Time									0.07**
R ²	0.32	0.37	0.37	0.34	0.36	0.36	0.36	0.35	0.35

* $p < .05$. ** $p < .01$.

Teacher Retention by Construct Averages

High School Results. Table 14.3E presents information from the OLS model (1) where the outcome variable is high school teacher retention and teaching conditions are represented individually by each of the eight construct averages (See Appendix B for calculations).

Model 14.3E. Model Summary Explaining High School Teacher Retention by Teaching Conditions Construct Averages (N=165)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Student, Teacher, School Variables									
Intercept	0.87**	0.80**	0.83**	0.86**	0.82**	0.90**	0.86**	0.91**	0.85**
membership	0.00**	0.00**	0.00**	0.00**	0.00**	0.00**	0.00**	0.00**	0.00**
% Minority Students	-0.12**	-0.12**	-0.12**	-0.12**	-0.12**	-0.12**	-0.12**	-0.12**	-0.12**
% Beginning Teachers	-0.63**	-0.61**	-0.62**	-0.63**	-0.62**	-0.64**	-0.63**	-0.65**	-0.63**
Teaching Condition Construct Averages									
Community Support & Involvement		0.02							
Teacher Leadership			0.01						
Facilities & Resources				0					
Instructional Practices & Support					0.02				
School Leadership						-0.01			
Professional Development							0		
Managing Student Conduct								-0.01	
Use of Time									0.01
R ²	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36

* $p < .05$. ** $p < .01$.

ABOUT THE NEW TEACHER CENTER

New Teacher Center focuses on improving student learning by accelerating the effectiveness of new teachers. NTC partners with states, school districts, and policymakers to design and implement systems that create sustainable, high-quality mentoring and professional development; build leadership capacity; work to enhance teaching conditions; improve retention; and transform schools in vibrant learning communities where all students succeed.

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