



# Student Achievement and Teacher Retention Analyses

## Introduction

With the leadership of (then) Governor Beshear and (then) Commissioner Holliday, the Kentucky Department of Education (KDE) and a coalition of partners<sup>1</sup> worked collaboratively with the New Teacher Center (NTC) to administer the third iteration of the Kentucky Teaching, Empowering, Leading, and Learning Survey (TELL Kentucky Survey) in spring 2015. 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 2015 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 brief 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 2015 TELL Kentucky Survey, tests the association between 2015 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.

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1. The coalition of education partners includes the Governor's Office, Kentucky Department of Education, Kentucky Association of School Superintendents, Kentucky School Boards Association, Kentucky Association of School Administrators, Kentucky Education Association, Education Professional Standards Board, Kentucky Chamber, Kentucky Association of School Councils, Kentucky Council on Postsecondary Education, and the Kentucky Parent Teachers Association.

The current education policy context, with its increasing emphasis on teacher and principal evaluation, 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.

## ***Providing Teachers with the Best Opportunity to Be Effective***

### **Connections Between Teaching Conditions and Student Learning**

Teacher success is facilitated by a positive school context, capable leadership, and a collaborative working environment. 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). Other research demonstrates the importance of communication and collaboration for improving student achievement. For example, 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 have a greater impact on test scores than the experience or credentials of the staff (Leana & Pil, 2006).

A 2009 analysis by Ladd that used NTC survey data also shows that teaching conditions are linked to student performance and can predict as much as 15 percent of school aggregate achievement results. Also using NTC survey data, Johnson, Kraft, and Papay (2011) find that positive conditions contribute to improved student achievement. Specifically, their research shows that in low-income, high-minority schools, perceptions of more positive teaching conditions are associated with better student academic outcomes.

More recent research describes how the conditions assessed by the 2012 TELL Massachusetts Survey theoretically and empirically link to important outcomes, including student learning. Ferguson with Hirsch (2014) demonstrate significant connections between teaching conditions and student value-added gains. In particular, the authors find that four areas assessed by the NTC survey—student conduct management, demands on time, professional autonomy, and professional development—are linked to the prerequisite conditions for achievement gains (e.g., student perceptions of support and rigor). Thus, positive educator perceptions in these four areas are associated with factors linked to improved student engagement and learning.



Additional recent work by Kraft and Papay (2014) also uses student-teacher linked data and school-level teaching conditions as measured by the NTC TELL Survey. The researchers find that teachers who work in more supportive environments become more effective at raising student achievement on standardized tests over time than do teachers who work in less supportive environments, after controlling for student characteristics, prior test scores, and teacher and school characteristics. 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.

### **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. In a meta-analysis of 34 studies, Borman and Dowling (2008) suggest that teaching and learning conditions influence teachers' career paths more than previously documented. Boyd et al. (2011) demonstrate 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). Studies also find statistically significant relationships between teachers' perceptions of school facilities and their plans to stay or leave (Loeb, Darling-Hammond, & Luczak, 2005; Buckley, Schneider, & Shang, 2004).

Similar to the student learning outcomes described previously, external researchers using NTC survey data from an instrument similar to the TELL Kentucky Survey also demonstrate associations between teaching conditions and teacher retention. Johnson, Kraft, and Papay (2011) find that teachers are more satisfied and plan 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, documents 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. This brief adds to this work by analyzing 2015 TELL Kentucky Survey data. The 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.

## 2015 TELL Kentucky Survey Participants

NTC administered the 2015 TELL Kentucky Survey to all school-based licensed educators in early 2015. The data for these analyses include responses from nearly 45,000 educators in Kentucky, yielding a response rate of 89.3 percent. This is a 2.6-percentage-point increase from the 86.7 percent response rate in the 2013 administration of the survey. Respondents include several categories of educators: 88.5 percent are teachers, 2.2 percent are principals, 2 percent are assistant principals, and 7.2 percent are other licensed educators such as librarians and school psychologists (Table 1). This distribution is similar to the data collected in 2013.

TABLE 1. PERCENT OF TOTAL RESPONDENTS BY PARTICIPANT TYPE

Respondents*	Percent of Total Respondents Spring 2015
Teacher	88.5 (39,788)
Principal	2.2 (1,004)
Assistant Principal	2.0 (899)
Other Education Professional	7.2 (3,242)
<b>Total</b>	44,933
<p><b>*Note.</b> 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.</p>	

Response rates also vary by school type. As Table 2 demonstrates, the 2015 sample of participants includes 91.8 percent of elementary school educators, 89.5 percent of middle school educators, 85.6 percent of high school educators, and 84.1 percent of educators assigned to schools such as alternative education settings (designated as "Special" in Table 2).

TABLE 2. SURVEY RESPONSE RATE BY SCHOOL TYPE

School Level	2015			2013		
	Responded	Headcount	Response Rate	Responded	Headcount	Response Rate
Elementary	22,995	25,040	91.8	22,880	25,407	90.1
Middle	8,159	9,115	89.5	8,189	9,548	85.8
High	11,510	13,449	85.6	11,408	13,826	82.5
Special	2,269	2,699	84.1	1,284	1,719	74.7
Total	44,933	50,303	89.3	43,761	50,500	86.7

Of the 1,409 schools across the state of Kentucky, 1,339 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 (95 percent). Those results can be accessed at <http://tellkentucky.org/results>.

## ***How Kentucky Teaching Conditions Impact Student Learning***

The goal of these analyses is to better understand how teaching conditions intersect with student performance and teacher retention in the context of Kentucky schools. Do schools with better teaching conditions have better student performance, greater academic growth, and/or higher teacher retention?

A brief summary of outcomes and approaches follows, with a detailed discussion of methodology in Appendix B. The Kentucky Performance Rating for Educational Progress (K-PREP) is used here to measure student performance in terms of absolute achievement in both reading and mathematics. In addition, a second student performance measure used in these analyses is a growth indicator that assesses academic progress. 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 level. The KDE provided additional variables of interest. The teaching conditions measures include both an overall indicator that combines all eight constructs as well as separate measures of each construct (see Appendix A). All measures are reported 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 teacher and student background characteristics. The analyses combine school-level data across elementary, middle, and high schools for state-level findings.

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.

## Teaching Conditions and Student Achievement Analyses

***In schools where higher proportions of educators report they have positive teaching conditions, higher percentages of students achieve proficiency on the K-PREP in both reading and math. Specifically, three conditions predict student achievement: schools with strong or sufficient community support and involvement, instructional practices and support, and student conduct management.***

These results are important because they show the impact of teaching conditions while controlling for factors such as student poverty, attendance rate, and student-teacher ratio. Statewide findings suggest that, for every 1-point increase in the overall teaching conditions composite mean (or average), the percentage of students proficient increases more than 10 percent in reading and more than 15 percent in math. The analyses also found that the contribution of positive teaching conditions to student learning in both reading and math is greater than the contribution of student-teacher ratio. Significantly, the contribution of community support and involvement to student achievement is stronger than the contribution of student-teacher ratio or teacher salary. See Appendix C for state-level model statistics.

School-level analyses testing the association between the percentage of students performing well on the K-PREP in both reading and math and overall teaching conditions suggest that at elementary and middle schools where educators report better teaching conditions, it is more likely that higher percentages of students perform better on the K-PREP in both subjects. In high schools, better teaching conditions are associated with higher student performance in math.

School-level analyses of individual constructs that represent areas of teaching conditions show that different factors matter at different school levels. At the elementary, middle school, and high school levels, for example, Community Support and Involvement has significant and positive associations with student learning in both reading and math after controlling for other student, teacher, and school factors. In addition, the analyses found that the contribution of Community Support and Involvement to student learning is greater than the contribution of various other student, teacher, and school predictors such as average years' teaching experience, dollars spent per student, and, in some cases, student poverty.

At all school levels, Managing Student Conduct has significant and positive associations with student learning (elementary and high school for reading, middle and high school for math) after controlling for other student, teacher, and school factors. The analyses found that the contribution of Managing Student Conduct to student learning is greater than the contribution of average years' teaching experience. Instructional Practices and Support was also found to have a significant and positive association with student proficiency in math at the elementary school level.



Alternatively, at the elementary and middle school levels, Professional Development demonstrated a significant association with student achievement but in the negative direction, and this contribution was greater than the contribution of average years' teaching experience. (One explanation might be that schools with low student performance are disproportionately identified for intensive professional development through programs such as federal School Improvement Grants and Title II funding.) In addition, at the middle school level, Teacher Leadership was found to have a significant and negative association with student achievement. For complete models, see Appendix C.

***In schools where educators report better teaching conditions, students show more academic growth on the K-PREP in both reading and math. In particular, schools with strong student conduct management systems and a highly involved and supportive community demonstrate more academic growth on the K-PREP in both reading and math compared to other schools.***

Again, these analyses control for other factors and isolate the relationship between student academic growth and teaching conditions both at the overall state level and when looking at individual teaching conditions at each school level. Results suggest that for every 1-point increase in the overall teaching conditions composite mean, the percentage of students meeting or exceeding academic growth compared to their peers, increases by 5 percent in reading and 10 percent in math. At the state level, the impact of teaching conditions on academic growth in reading and math is stronger than teacher salary or student-teacher ratio. Furthermore, the impact of teaching conditions on academic growth in math in particular are stronger than the percentage of students classified as receiving free or reduced-price lunches. See Appendix D for full models.

Individual analyses for each school level testing the relationship between student growth and overall perceived teaching conditions show that the composite teaching conditions measure is significant and positive at the elementary and middle school levels for reading and at all school levels for math. In the high school model, teaching conditions overall did not impact student growth in reading.

When testing the association between each teaching condition construct and student academic growth at each school level, analyses indicate that Community Support and Involvement consistently has a positive impact on student academic growth in reading at the elementary level and in both reading and math at the middle school level.

## Teaching Conditions and Teacher Retention Analyses

***Overall, perceptions of positive teaching conditions are significantly related to higher teacher retention before controlling for teacher and school-level variables. When considering individual teaching conditions, schools with strong or sufficient teacher leadership supports retain more teachers compared to schools where teachers report less positive perceptions about these conditions.***

At the state level, the contribution of overall teaching conditions is a statistically significant predictor of teacher retention when controlling only for student-level factors. Once teacher-level variables such as Average Years' of Teaching Experience and Percentage of First Year Teachers are considered, the relationship is no longer statistically significant. When looking at the contributions of individual teaching conditions in the identified construct areas, and after including student, teacher, and school-level characteristics, data suggest that in schools where teachers report better teaching conditions related to Teacher Leadership, fewer teachers choose to leave the classroom. See Appendix E for full models.

Models that examine the influence of individual teaching conditions on teacher retention at each school level show that different conditions matter at different school levels. In elementary schools, for example, where teachers perceive strong Community Support and Involvement, they are more likely to stay, a finding that is statistically significant before considering additional teacher and school-level variables. At the middle school level, Community Support and Involvement as well as School Leadership were significant prior to accounting for additional student, teacher, and school factors. At the high school level, prior to considering teacher and school-level variables, perceptions of the Facilities and Resources available contribute to teacher decisions to remain in a school. Appendix E presents tables associated with these findings.





## **Summary**

These analyses show that better teaching conditions are consistently associated with better outcomes in terms of both student performance and teacher retention. Specifically, Community Support and Involvement is consistently related to higher student achievement and higher academic growth. In some cases, the impact of teaching conditions on student achievement is stronger than the influence of historically strong predictors in education such as percentage of students eligible for free or reduced lunch. In addition, on average, schools that value teachers taking on leadership roles experience lower teacher turnover.

## **Implications and Limitations**

Together, these analyses demonstrate that many factors that are within the control of stakeholders and policymakers contribute to creating environments where strong teaching and learning can occur. These findings suggest that community support and involvement, student conduct management, and instructional practices and support play key roles in improving student achievement. Stakeholders may consider additional analyses to better understand the intersection between these conditions and outcomes of interest at different school levels.

This evidence suggests that, overall, teaching conditions are consistently related to improved learning and teacher retention. Based on these findings, local education agencies and campuses should review their TELL district- and school-level reports. These data can enhance conversations about how to maintain and improve the teaching conditions that analyses demonstrate help teachers and students succeed.



**Appendix A. TELL Items, Constructs, and Composite Calculations**

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



**Appendix A. TELL Items, Constructs, and Composite Calculations (continued)**

Construct	Survey Items
<p><b>Community Support &amp; Involvement</b>—Community and parent/guardian communication and influence in the school</p>	<p>Parents/guardians are influential decision makers in this school.</p> <p>This school maintains clear, two-way communication with the community.</p> <p>This school does a good job of encouraging parent/guardian involvement.</p> <p>Teachers provide parents/guardians with useful information about student learning.</p> <p>Parents/guardians know what is going on in this school.</p> <p>Parents/guardians support teachers, contributing to their success with students.</p> <p>Community members support teachers, contributing to their success with students.</p> <p>The community we serve is supportive of this school.</p>
<p><b>Managing Student Conduct</b>—Policies and practices to address student conduct issues and ensure a safe school environment</p>	<p>Students at this school understand expectations for their conduct.</p> <p>Students at this school follow rules of conduct.</p> <p>Policies and procedures about student conduct are clearly understood by the faculty.</p> <p>School administrators consistently enforce rules for student conduct.</p> <p>School administrators support teachers' efforts to maintain discipline in the classroom.</p> <p>Teachers consistently enforce rules for student conduct.</p> <p>The faculty work in a school environment that is safe.</p>



**Appendix A. TELL Items, Constructs, and Composite Calculations (continued)**

Construct	Survey Items
<p><b>Teacher Leadership</b>—Teacher involvement in decisions that impact classroom and school practices</p>	<p>Teachers are recognized as educational experts.</p> <p>Teachers are trusted to make sound professional decisions about instruction.</p> <p>Teachers are relied upon to make decisions about educational issues.</p> <p>Teachers are encouraged to participate in school leadership roles.</p> <p>The faculty has an effective process for making group decisions to solve problems.</p> <p>In this school we take steps to solve problems.</p> <p>Teachers are effective leaders in this school.</p> <p>Teachers have an appropriate level of influence on decision making in this school.</p>
<p><b>School Leadership</b>—The ability of school leadership to create trusting, supportive environments and address teacher concerns</p>	<p>The faculty and leadership have a shared vision.</p> <p>There is an atmosphere of trust and mutual respect in this school.</p> <p>Teachers feel comfortable raising issues and concerns that are important to them.</p> <p>The school leadership consistently supports teachers.</p> <p>Teachers are held to high professional standards for delivering instruction.</p> <p>The school leadership facilitates using data to improve student learning.</p> <p>Teacher performance is assessed objectively.</p> <p>Teachers receive feedback that can help them improve teaching.</p> <p>The procedures for teacher evaluation are consistent.</p> <p>The school improvement team provides effective leadership at this school.</p> <p>The faculty are recognized for accomplishments.</p> <p>Teachers on the school council are representative of the faculty (i.e., experience, subject/grade, etc.)</p> <p>Parents on the school council are representative of the diversity within the school community.</p> <p>The school council makes decisions that positively impact instruction (i.e., curriculum, instructional practices, etc.).</p> <p>The school council makes decisions that positively impact school staffing and schedules.</p> <p>Overall, the school council provides effective leadership in this school.</p>



**Appendix A. TELL Items, Constructs, and Composite Calculations (continued)**

Construct	Survey Items
<p><b>Professional Development—</b> Availability and quality of learning opportunities for educators to enhance their teaching</p>	<p>Sufficient resources are available for professional development in my school.</p> <p>An appropriate amount of time is provided for professional development.</p> <p>Professional development offerings are data driven.</p> <p>Professional learning opportunities are aligned with the school's improvement plan.</p> <p>Professional development is differentiated to meet the needs of individual teachers.</p> <p>Decision making about professional development is guided by the teacher evaluation system (PGES).</p> <p>Professional development deepens teachers' content knowledge.</p> <p>Teachers have sufficient training to fully utilize instructional technology.</p> <p>Teachers are encouraged to reflect on their own practice.</p> <p>In this school, follow up is provided from professional development.</p> <p>Professional development provides ongoing opportunities for teachers to work with colleagues to refine teaching practices.</p> <p>Professional development is evaluated and results are communicated to teachers.</p> <p>Professional development enhances teachers' ability to implement instructional strategies that meet diverse student learning needs.</p> <p>Professional development enhances teachers' abilities to improve student learning.</p>



**Appendix A. TELL Items, Constructs, and Composite Calculations (continued)**

Construct	Survey Items
<p><b>Instructional Practices &amp; Support</b>—Data and support available to teachers to improve instruction and student learning</p>	<p>State assessment data are available in time to impact instructional practices.</p> <p>Local assessment data are available in time to impact instructional practices.</p> <p>Teachers use assessment data to inform their instruction.</p> <p>Teachers work in professional learning communities to develop and align instructional practices.</p> <p>Provided supports (i.e., instructional coaching, professional learning communities, etc.) translate to improvements in instructional practices by teachers.</p> <p>Teachers are encouraged to try new things to improve instruction.</p> <p>Teachers are assigned classes that maximize their likelihood of success with students.</p> <p>Teachers have autonomy to make decisions about instructional delivery (i.e., pacing, materials and pedagogy).</p> <p>The curriculum taught in this school is aligned with Kentucky Core Academic Standards.</p> <p>State assessment data are available in time to impact instructional practices.</p> <p>Local assessment data are available in time to impact instructional practices.</p>



### 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 "Strongly Disagree" and "Disagree" were coded as 0, responses of "Agree" and "Strongly Agree" were coded as 1, and 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.

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

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

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

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

## 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:

$$(1) Y_i = \beta_0 + \beta_1(\text{Teaching Conditions}) + \beta_2(\text{Student}) + \beta_3(\text{Teacher}) + \beta_4(\text{School}) + \beta_i$$

Multiple variables were included in every model regardless of statistical significance. These variables were indicators for teaching conditions ( $\beta_1$ ), student poverty, as well as gender and race indicators for both students ( $\beta_2$ ) and teachers ( $\beta_3$ ). Since there were no school-level ( $\beta_4$ ) variables included regardless of statistical significance, not all results tables show four models. Therefore, if only three models are presented in the following tables, it is because all tested school-level variables were not found to have a statistically significant relationship with the given dependent variable.

All variables 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  $\beta_0$  represents the value of the outcome variable when all the independent variables are at zero. The independent variables are represented by  $\beta_1-4$  and include blocks of characteristics about teaching conditions, students, teachers, and schools. Examples of independent variables include:

- Student-level predictors: Percent of minority students in the school, percent of students with free/reduced-price lunch, academic performance, etc.
- Teacher-level predictors: Gender, years of experience, percent with national board certification, etc.
- School-level predictors: Student-to-teacher ratio, enrollment, etc.



Full descriptions of variables included in each block for these analyses are provided below.

The teaching conditions measure consists of the average of the eight construct means for each school. The  $\beta$ , 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  $\beta$  is positive, then as the independent variable increases, the outcome variable increases. If the  $\beta$  is negative, then as the independent variable increases, the outcome variable decreases. The  $\beta_i$  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 same model (2) is then calculated with the student growth indicator (median student growth percentile) as the outcome or  $Y_i$ .

$$(2) Y_i = \beta_0 + \beta_1(\text{Teaching Conditions}) + \beta_2(\text{Student}) + \beta_3(\text{Teacher}) + \beta_4(\text{School}) + \beta_i$$

The teacher retention regression model (3) follows a similar equation as presented for the student outcome models. The rate of teachers leaving classrooms is the outcome variable  $Y_i$ .

$$(3) Y_i = \beta_0 + \beta_1(\text{Teaching Conditions}) + \beta_2(\text{Student}) + \beta_3(\text{Teacher}) + \beta_4(\text{School}) + \beta_i$$

## 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 [ $\# \text{ male educators} / \text{total } \# \text{ educators}$ ] 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 - % 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 [# male students / total # 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 - (# white students / total # 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

### Statewide Composite

#### Reading

Table C-1 presents information from the OLS model (1) where the outcome variable is the performance on the K-PREP Reading assessment (English II EOC for High School), teaching conditions is a composite measure across all eight constructs, and the elementary, middle, and high school levels are combined. The unstandardized coefficient for the teaching conditions composite mean in the full model (Model 4) indicates that, after controlling for other student, teacher, and school-level variables, for every 1-point change in the teaching conditions mean, the percentage of proficient students on the K-PREP Reading assessment increases by more than 10 percentage points.

TABLE C-1. MODEL SUMMARY EXPLAINING STUDENT READING ACHIEVEMENT BY OVERALL TEACHING CONDITIONS COMPOSITE (N=1,021)

Variable	Model 1		Model 2		Model 3		Model 4	
	B	SE B	B	SE B	B	SE B	B	SE (B)
Intercept	-11.640*	5.240	-57.303**	11.239	-73.575**	13.338	-48.533**	14.828
Teaching Conditions Composite Mean	20.670**	1.663	11.149**	1.134	10.547**	1.153	10.539**	1.153
Attendance Rate			130.808**	10.874	135.389**	11.844	116.526**	13.177
Percent Free and Reduced Lunch			-35.531**	1.600	-33.488**	1.680	-34.052**	1.684
Percent Minority Students			-17.036**	1.309	-17.657**	2.149	-15.406**	2.206
Percent Male Students			-42.500**	4.902	-42.538**	4.913	-44.951**	4.899
Percent Minority Teachers					-3.453	6.184	-5.96	6.153
Percent Male Teachers					0.242	1.995	0.079	1.980
Average Years of Teaching Experience					0.332**	.102	0.466**	.105
Average Teacher Salary (District)							0.000*	.000
Student Teacher Ratio							-0.286**	.077
Average Expenditure per Student							-0.000**	.000
R <sup>2</sup>	0.132		0.634		0.642		0.649	
F for change in R <sup>2</sup>	154.963**		348.040**		5.648**		10.061**	
*p<.05 **p<.01								

*Math*

Table C-2 presents information from the OLS model (1) where the outcome variable is the performance on the K-PREP Math assessment (Algebra II EOC for High School), teaching conditions is a composite measure across all eight constructs, and the elementary, middle, and high school levels are combined. The unstandardized coefficient for the teaching conditions composite mean in the full model (Model 4) indicates that, after controlling for other student, teacher, and school-level variables, for every 1-point change in the teaching conditions mean, the percentage of proficient students on the K-PREP Math assessment increases more than 15 percentage points.

TABLE C-2. MODEL SUMMARY EXPLAINING STUDENT MATH ACHIEVEMENT BY OVERALL TEACHING CONDITIONS COMPOSITE (N=1,022)								
Variable	Model 1		Model 2		Model 3		Model 4	
	B	SE B	B	SE B	B	SE B	B	SE (B)
Intercept	-38.441**	6.212	-162.30**	13.645	-135.92**	15.265	-104.3**	17.045
Teaching Conditions Composite Mean	26.215**	1.971	19.003**	1.561	15.512**	1.517	15.781**	1.517
Attendance Rate			203.959**	13.086	168.323**	13.427	142.30**	15.145
Percent Free and Reduced Lunch			-30.771**	2.189	-30.804**	2.161	-31.08**	2.175
Percent Minority Students			-3.643*	1.771	-13.766**	2.716	-11.44**	2.764
Percent Male Students			-49.895**	6.383	-41.857**	6.089	-42.53**	6.052
Percent Minority Teachers					9.92	8.062	5.693	8.071
Percent Male Teachers					25.037**	2.598	25.27**	2.582
Average Teacher Salary (District)							0.000**	.000
Student Teacher Ratio							-0.243*	.098
Average Expenditure per Student							0.001**	.000
R <sup>2</sup>	0.147		0.508		0.559		0.586	
F for change in R <sup>2</sup>	177.183**		187.649**		40.088**		10.605**	
*p<.05 **p<.01								



**Statewide by TELL Construct**

*Reading*

Models at the state level that included the individual teaching conditions show that Community Support and Involvement, Instructional Practices and Support, and Managing Student Conduct have a significant and consistently positive association with student achievement in reading. Teacher Leadership and Professional Development have a significant and negative association with student achievement in reading. See Table C-3.

TABLE C-3. MODEL SUMMARY EXPLAINING STUDENT READING ACHIEVEMENT BY TEACHING CONDITIONS CONSTRUCTS (N=1,021)

Variable	Model 1		Model 2		Model 3		Model 4	
	B	SE B	B	SE B	B	SE B	B	SE (B)
Intercept	-26.711**	5.736	-51.910**	11.245	-78.577**	13.053	-53.329**	14.423
TELL: Time	-0.519	1.977	2.525	1.567	2.254	1.584	2.345	1.589
TELL: Community Support & Involvement	37.387**	2.019	14.440**	1.819	14.498**	1.894	13.990**	1.894
TELL: Facilities & Resources	-0.801	2.310	-0.572	1.778	-0.293	1.782	0.463	1.776
TELL: Managing Student Conduct	3.967*	1.833	3.370*	1.422	3.676*	1.443	3.697**	1.430
TELL: Teacher Leadership	-13.489**	3.484	-6.624*	2.714	-6.330*	2.703	-6.078*	2.679
TELL: School Leadership	6.536	4.068	1.322	3.163	1.147	3.185	0.617	3.161
TELL: Professional Development	-25.066**	2.915	-7.675**	2.339	-8.699**	2.368	-9.113**	2.350
TELL: Instructional Practices & Support	16.466**	4.096	7.376*	3.202	7.881*	3.192	8.490**	3.174
Attendance Rate			107.863**	11.061	120.066**	11.739	99.661**	12.950
Percent Free and Reduced Lunch			-29.452**	1.754	-26.879**	1.848	-27.450**	1.864
Percent Minority Students			-14.944**	1.324	-15.174**	2.095	-12.895**	2.151
Percent Male Students			-38.576**	4.791	-39.073**	4.790	-40.992**	4.773
Average Years of Teaching Experience					0.246*	.100	0.374**	.104
Average Teacher Salary (District)					0.000*	.000	0.000**	.000
Percent Minority Teachers					-6.785	5.985	-8.815	5.954
Percent Male Teachers					4.607*	2.102	4.085	2.088
Student Teacher Ratio							-0.232**	.076
Average Expenditure per Student							-0.000**	.000
R <sup>2</sup>	0.424		0.662		0.669		0.676	
F for change in R <sup>2</sup>	93.118**		177.444**		5.308**		10.824**	

\*p<.05 \*\*p<.01

*Math*

Similar to the results of the student achievement in reading models, models at the state level that included the individual teaching conditions show that Community Support and Involvement, Instructional Practices and Support, and Managing Student Conduct have a significant and consistently positive association with student achievement in math. Teacher Leadership and Professional Development have a significant and negative association with student achievement. See Table C-4.

TABLE C-4. MODEL SUMMARY EXPLAINING STUDENT MATH ACHIEVEMENT BY TEACHING CONDITIONS CONSTRUCTS (N=1,022)

Variable	Model 1		Model 2		Model 3		Model 4	
	B	SE B	B	SE B	B	SE B	B	SE (B)
Intercept	-56.384**	6.871	-152.00**	13.403	-144.74**	15.087	-113.84**	16.848
TELL: Time	-9.598**	2.363	-2.93	2.121	0.421	2.103	1.024	2.114
TELL: Community Support & Involvement	41.984**	2.413	21.788**	2.475	16.122**	2.514	15.803**	2.507
TELL: Facilities & Resources	0.844	2.765	-0.393	2.407	1.227	2.348	1.837	2.335
TELL: Managing Student Conduct	10.108**	2.197	9.947**	1.925	7.234**	1.915	7.214**	1.900
TELL: Teacher Leadership	-9.247*	4.156	-4.945	3.657	-5.351	3.556	-5.011	3.529
TELL: School Leadership	-6.349	4.905	-6.937	4.307	-1.912	4.234	-2.508	4.208
TELL: Professional Development	16.531**	3.509	-4.848	3.184	-9.378**	3.155	-9.397**	3.130
TELL: Instructional Practices & Support	19.552**	4.919	11.257**	4.330	11.687**	4.207	11.343**	4.180
Attendance Rate			167.001**	12.949	151.280**	13.334	125.926**	14.926
Percent Free and Reduced Lunch			-21.107**	2.368	-22.986**	2.423	-23.346**	2.446
Percent Minority Students			-1.993	1.753	-10.166**	2.680	-7.973**	2.725
Percent Male Students			-40.992**	6.151	-36.822**	5.997	-37.503**	5.961
Percent Minority Teachers					5.74	7.867	2.195	7.874
Percent Male Teachers					18.466**	2.783	-19.099**	2.771
Average Teacher Salary (District)					0.000**	.000	0.000**	.000
Student Teacher Ratio							-0.197*	.096
Average Expenditure per Student							0.001**	.000
R <sup>2</sup>	0.42		0.564		0.59		0.597	
F for change in R <sup>2</sup>	93.118**		177.444**		5.308**		10.824**	
*p<.05 **p<.01								

## School-Level Composite

### Reading

Models for elementary and middle school levels testing the association between the percentage of students passing K-PREP reading assessments and overall teaching conditions show positive and significant associations (see Tables C-5–C-6). Significant differences between the two variables were not found at the high school level (Table C-7).

TABLE C-5. MODEL SUMMARY EXPLAINING ELEMENTARY SCHOOL STUDENT READING ACHIEVEMENT BY OVERALL TEACHING CONDITIONS (N=660)

Variable	Model 1		Model 2		Model 3		Model 4	
	B	SE B	B	SE B	B	SE B	B	SE (B)
Intercept	-22.512**	6.175	-33.16	33.314	-55.573	35.547	-63.435	35.339
Teaching Conditions Composite Mean	24.049**	1.935	14.097**	1.416	13.798**	1.419	13.647**	1.416
Attendance Rate			82.005*	32.603	92.542**	34.181	105.854**	34.122
Percent Free and Reduced Lunch			-37.079**	2.294	-33.922**	2.449	-33.554**	2.497
Percent Minority Students			-14.780**	1.714	-15.268**	2.749	-14.749**	2.741
Percent Male Students			-15.714	10.943	-18.379	10.887	-18.562	10.802
Percent Minority Teachers					-4.207	7.388	-6.326	7.363
Percent Male Teachers					-4.406	4.841	-6.104	4.827
Average Years of Teaching Experience					0.364**	.124	0.489**	.129
Average Teacher Salary (District)					0	.000	0.000*	.000
Student Teacher Ratio							-0.379**	.111
Average Expenditure per Student							-0.000*	.000
R <sup>2</sup>	0.19		0.625		0.633		0.64	
F for change in R <sup>2</sup>	154.346**		189.660**		3.542**		6.300**	

\*p<.05 \*\*p<.01





**TABLE C-6. MODEL SUMMARY EXPLAINING MIDDLE SCHOOL STUDENT READING ACHIEVEMENT BY OVERALL TEACHING CONDITIONS (N=199)**

Variable	Model 1		Model 2		Model 3		Model 4	
	B	SE B	B	SE B	B	SE B	B	SE (B)
Intercept	-16.949	12.517	-86.654**	23.589	-87.353**	23.237	-93.443**	22.872
Teaching Conditions Composite Mean	22.578**	4.048	10.422**	2.447	9.240**	2.442	9.563**	2.396
Attendance Rate			154.791**	21.653	149.217**	21.203	156.878**	20.947
Percent Free and Reduced Lunch			-39.570**	3.584	-38.580**	3.588	-39.398**	3.528
Percent Minority Students			-16.517**	2.851	-10.162*	4.346	-8.204	4.311
Percent Male Students			-23.273**	8.116	-24.666**	8.033	-23.697**	7.881
Percent Minority Teachers					-14.472	11.650	-15.029	11.421
Percent Male Teachers					10.737*	5.326	9.3	5.244
Average Years of Teaching Experience					0.526**	.179	0.778**	.195
Student Teacher Ratio							-0.314**	.107
R <sup>2</sup>	0.136		0.719		0.737		0.748	
F for change in R <sup>2</sup>	31.009**		100.106**		4.335**		8.250**	
*p<.05 **p<.01								

TABLE C-7. MODEL SUMMARY EXPLAINING HIGH SCHOOL STUDENT READING ACHIEVEMENT BY OVERALL TEACHING CONDITIONS (N=148)

Variable	Model 1		Model 2		Model 3		Model 4	
	B	SE B	B	SE B	B	SE B	B	SE (B)
Intercept	33.288*	15.900	-35.819	29.381	-30.959	31.837	-5.752	31.980
Teaching Conditions Composite Mean	6.237	5.222	1.395	3.351	1.311	3.386	1.89	3.293
Attendance Rate			162.094**	28.421	157.922**	30.151	127.833**	30.865
Percent Free and Reduced Lunch			-35.602**	5.278	-35.654**	5.315	-32.868**	5.240
Percent Minority Students			-11.645*	5.173	-9.45	7.213	-5.615	7.113
Percent Male Students			-82.141**	10.613	-83.532**	11.168	-68.787**	11.855
Percent Minority Teachers					-10.579	24.061	-9.556	23.366
Percent Male Teachers					0.048	7.565	1.18	7.355
Average Expenditure per Student							-0.001**	.000
R <sup>2</sup>	0.01		0.653		0.654		0.676	
F for change in R <sup>2</sup>	1.475		65.782**		0.202		9.438**	
*p<.05 **p<.01								

*Math*

Models for elementary, middle, and high school levels testing the association between the percentage of students passing K-PREP math assessments and overall teaching conditions show positive and significant associations (see Tables C-8–C-10).

TABLE C-8. MODEL SUMMARY EXPLAINING ELEMENTARY SCHOOL STUDENT MATH ACHIEVEMENT BY OVERALL TEACHING CONDITIONS (N=660)

Variable	Model 1		Model 2		Model 3		Model 4	
	B	SE B	B	SE B	B	SE B	B	SE (B)
Intercept	-21.538**	6.947	-190.91**	41.317	-222.67**	43.743	-227.83**	43.473
Teaching Conditions Composite Mean	21.790**	2.177	15.500**	1.757	14.969**	1.751	14.875**	1.749
Attendance Rate			235.087**	40.435	248.932**	42.109	261.105**	41.981
Percent Free and Reduced Lunch			-35.202**	2.845	-30.700**	2.994	-30.224**	3.052
Percent Minority Students			-4.998*	2.126	-13.997**	3.307	-13.942**	3.294
Percent Male Students			-19.643	13.572	-22.748	13.440	-22.633	13.346
Percent Minority Teachers					7.432	9.057	4.368	9.060
Percent Male Teachers					-12.854*	5.976	-14.670*	5.959
Average Teacher Salary (District)					0.000**	.000	0.001**	.000
Student Teacher Ratio							-0.396**	.133
Average Expenditure per Student							-0.000*	.000
R <sup>2</sup>	0.132		0.511		0.526		0.534	
F for change in R <sup>2</sup>	100.065**		126.721**		6.867**		5.571**	

\*p<.05 \*\*p<.01

TABLE C-9. MODEL SUMMARY EXPLAINING MIDDLE SCHOOL STUDENT MATH ACHIEVEMENT BY OVERALL TEACHING CONDITIONS (N=198)

Variable	Model 1		Model 2		Model 3		Model 4	
	B	SE B	B	SE B	B	SE B	B	SE (B)
Intercept	-29.903*	13.116	-70.761*	28.594	-71.393*	28.821	-78.962**	28.399
Teaching Conditions Composite Mean	23.057**	4.242	11.734**	2.966	10.902**	3.028	11.300**	2.974
Attendance Rate			123.435**	26.248	119.932**	26.294	129.359**	26.004
Percent Free and Reduced Lunch			-42.001**	4.349	-41.742**	4.451	-42.769**	4.381
Percent Minority Students			-12.637**	3.464	-9.965	5.395	-7.528	5.360
Percent Male Students			-25.076*	9.839	-25.620*	9.964	-24.382*	9.785
Percent Minority Teachers					-4.217	14.444	-4.87	14.174
Percent Male Teachers					8.947	6.604	7.182	6.509
Average Years of Teaching Experience					0.328	.222	0.637**	.243
Student Teacher Ratio							-0.382**	.133
R <sup>2</sup>	0.131		0.622		0.629		0.645	
F for change in R <sup>2</sup>	29.547**		62.349**		1.189		8.473**	
*p<.05 **p<.01								



TABLE C-10. MODEL SUMMARY EXPLAINING HIGH SCHOOL STUDENT MATH ACHIEVEMENT BY OVERALL TEACHING CONDITIONS (N=147)

Variable	Model 1		Model 2		Model 3		Model 4	
	B	SE B	B	SE B	B	SE B	B	SE (B)
Intercept	-14.34	19.322	54.046**	20.544	45.579*	21.348	34.27	19.424
Teaching Conditions Composite Mean	15.383*	6.341	11.405	5.992	13.760*	6.001	17.625**	5.474
Percent Free and Reduced Lunch			-36.074**	8.410	-39.323**	8.382	-25.072**	7.994
Percent Minority Students			-3.477	8.664	-20.616	11.014	-10.968	10.113
Percent Male Students			-64.398**	17.982	-60.417**	17.827	-31.247	16.940
Percent Minority Teachers					97.098*	39.296	115.464**	35.712
Percent Male Teachers					2.506	12.265	5.237	11.111
Average Expenditure per Student							-0.003**	.000
R <sup>2</sup>	0.039		0.25		0.283		0.417	
F for change in R <sup>2</sup>	5.884		13.316**		3.222		31.949**	
*p<.05 **p<.01								



### School Level by TELL Construct

#### Reading

Models for each school level that included the individual teaching conditions show that, at the elementary, middle, and high school levels, Community Support & Involvement has a significant and consistently positive association with student learning in reading. At the elementary and high school levels, Managing Student Conduct has a significant and consistently positive association with student learning in reading. Professional Development at the elementary and middle school levels, Teacher Leadership at the middle school level, and Facilities and Resources at the high school level all have a significant and negative association with student achievement in reading. For complete models, see Tables C-11–C-13.

TABLE C-11. MODEL SUMMARY EXPLAINING ELEMENTARY SCHOOL STUDENT READING ACHIEVEMENT BY TEACHING CONDITIONS CONSTRUCTS (N=660)

Variable	Model 1		Model 2		Model 3		Model 4	
	B	SE B	B	SE B	B	SE B	B	SE (B)
Intercept	-31.360**	6.557	-33.063	33.440	-50.365	35.335	-57.676	35.089
TELL: Time	-2.747	2.301	1.235	1.990	1.924	1.991	1.782	1.985
TELL: Community Support & Involvement	40.290**	2.308	16.035**	2.485	14.898**	2.500	14.721**	2.479
TELL: Facilities & Resources	-1.246	2.607	0.472	2.213	1.123	2.220	1.54	2.204
TELL: Managing Student Conduct	7.860**	2.253	3.971*	1.938	3.896*	1.934	3.932*	1.917
TELL: Teacher Leadership	-2.41	4.082	-1.382	3.437	-1.213	3.423	-1.636	3.398
TELL: School Leadership	-4.936	4.626	-1.471	3.923	-1.163	3.920	-0.981	3.889
TELL: Professional Development	-14.880**	3.387	-5.527	2.953	-6.714*	2.960	-7.073*	2.935
TELL: Instructional Practices & Support	4.033	4.702	3.571	3.966	3.669	3.963	4.186	3.933
Attendance Rate			64.014	33.024	70.416*	34.407	82.505*	34.269
Percent Free and Reduced Lunch			-28.880**	2.691	-26.654**	2.777	-26.373**	2.808
Percent Minority Students			-12.568**	1.780	-13.745**	2.721	-13.124**	2.712
Percent Male Students			-12.965	10.685	-16.005	10.664	-16.155	10.572
Percent Minority Teachers					-4.347	7.224	-6.451	7.192
Percent Male Teachers					-4.683	4.746	-6.383	4.728
Average Years of Teaching Experience					0.267*	.124	0.398**	.128
Average Teacher Salary (District)					0.000*	.000	0.000**	.000
Student Teacher Ratio							-0.382**	.108
Average Expenditure per Student							-0.000*	.000
R <sup>2</sup>	0.496		0.649		0.656		0.663	
F for change in R <sup>2</sup>	80.083**		70.506**		3.271**		6.657**	

\*p<.05 \*\*p<.01

TABLE C-12. MODEL SUMMARY EXPLAINING MIDDLE SCHOOL STUDENT READING ACHIEVEMENT BY TEACHING CONDITIONS CONSTRUCTS (N=199)

Variable	Model 1		Model 2		Model 3		Model 4	
	B	SE B	B	SE B	B	SE B	B	SE (B)
Intercept	-40.615**	11.313	-88.196**	21.417	-87.202**	21.052	-57.676	35.089
TELL: Time	5.074	3.790	5.855*	2.883	4.95	2.829	1.782	1.985
TELL: Community Support & Involvement	49.204**	4.000	22.385**	3.803	20.801**	3.769	14.721**	2.479
TELL: Facilities & Resources	0.982	4.152	-0.242	3.117	0.575	3.061	1.54	2.204
TELL: Managing Student Conduct	2.939	3.550	5.188	2.707	4.894	2.670	3.932*	1.917
TELL: Teacher Leadership	-31.373**	6.986	-19.861**	5.411	-17.814**	5.350	-1.636	3.398
TELL: School Leadership	16.288*	7.522	5.704	5.845	4.008	5.734	-0.981	3.889
TELL: Professional Development	-27.148**	5.520	-9.770*	4.372	-11.873**	4.391	-7.073*	2.935
TELL: Instructional Practices & Support	14.21	7.711	8.211	6.002	11.284	5.961	4.186	3.933
Attendance Rate			121.746**	21.265	114.706**	20.870	82.505*	34.269
Percent Free and Reduced Lunch			-28.034**	3.861	-27.831**	3.840	-26.373**	2.808
Percent Minority Students			-12.809**	2.652	-5.791	3.906	-13.124**	2.712
Percent Male Students			-15.106*	7.254	-17.226*	7.169	-16.155	10.572
Percent Minority Teachers					-19.058	10.370	-6.451	7.192
Percent Male Teachers					9.607*	4.732	-6.383	4.728
Average Years of Teaching Experience					0.410*	.166	0.398**	.128
R <sup>2</sup>	0.612		0.791		0.804		0.663	
F for change in R <sup>2</sup>	37.461**		39.825**		4.046**		6.657**	
*p<.05 **p<.01								



TABLE C-13. MODEL SUMMARY EXPLAINING HIGH SCHOOL STUDENT READING ACHIEVEMENT BY TEACHING CONDITIONS CONSTRUCTS (N=148)

Variable	Model 1		Model 2		Model 3		Model 4	
	B	SE B	B	SE B	B	SE B	B	SE (B)
Intercept	-4.934	19.937	-24.99	30.795	-21.844	33.241	12.616	33.117
TELL: Time	9.121	6.679	3.498	4.603	3.045	4.701	3.533	4.495
TELL: Community Support & Involvement	29.166**	7.637	5.246	5.454	5.886	5.574	11.856*	5.568
TELL: Facilities & Resources	-8.87	8.057	-10.317	5.370	-11.111*	5.583	-12.828*	5.356
TELL: Managing Student Conduct	9.174	5.219	10.399**	3.485	10.512**	3.510	9.680**	3.362
TELL: Teacher Leadership	-16.623	10.915	-4.571	7.306	-4.108	7.400	-0.353	7.146
TELL: School Leadership	15.011	13.685	-6.985	9.253	-7.745	9.377	-13.252	9.086
TELL: Professional Development	35.008**	9.593	-5.076	6.853	-4.35	6.980	-2.138	6.698
TELL: Instructional Practices & Support	33.467*	12.866	10.815	8.704	10.908	8.913	7.044	8.583
Attendance Rate			147.605**	27.960	143.705**	29.565	104.834**	30.160
Percent Free and Reduced Lunch			-34.463**	5.535	-34.502**	5.574	-29.757**	5.481
Percent Minority Students			-8.891	5.118	-6.779	7.166	-1.197	7.014
Percent Male Students			-85.303**	11.245	-87.120**	11.757	-70.287**	12.129
Percent Minority Teachers					-10.949	24.306	-15.439	23.263
Percent Male Teachers					3.981	7.739	6.446	7.426
Average Expenditure per Student							-0.001**	.000
R <sup>2</sup>	0.269		0.69		0.691		0.72	
F for change in R <sup>2</sup>	6.394**		45.835**		0.215		13.671**	
*p<.05 **p<.01								



*Math*

Models for each school level that included the individual teaching conditions show that, at the elementary, middle, and high school levels, Community Support & Involvement has a significant and consistently positive association with student learning in math. Instructional Practices and Support at the elementary school level and Managing Student Conduct at the middle and high school levels have a significant and consistently positive association with student learning in math. Professional Development at the elementary and middle school levels, Teacher Leadership at the middle school level, and both School Leadership and Facilities and Resources at the high school level have a significant and negative association with student achievement in math. For complete models, see Tables C-14–C-16.

**TABLE C-14. MODEL SUMMARY EXPLAINING ELEMENTARY STUDENT MATH ACHIEVEMENT BY TEACHING CONDITIONS CONSTRUCTS (N=660)**

Variable	Model 1		Model 2		Model 3		Model 4	
	B	SE B	B	SE B	B	SE B	B	SE (B)
Intercept	-39.152**	7.910	-186.846**	41.928	-215.451**	43.840	-220.847**	43.495
TELL: Time	-4.658	2.776	2.975	2.495	4.227	2.475	4.242	2.468
TELL: Community Support & Involvement	38.877**	2.784	13.930**	3.115	13.345**	3.074	13.631**	3.048
TELL: Facilities & Resources	0.935	3.145	0.653	2.775	0.78	2.734	0.871	2.711
TELL: Managing Student Conduct	6.845*	2.717	4.12	2.430	4.099	2.403	4.122	2.382
TELL: Teacher Leadership	-1.76	4.924	-4.319	4.309	-4.362	4.253	-4.888	4.222
TELL: School Leadership	9.481	5.580	-0.582	4.918	1.242	4.862	1.648	4.825
TELL: Professional Development	-16.985**	4.086	-8.580*	3.703	-10.680**	3.678	-11.051**	3.648
TELL: Instructional Practices & Support	12.494*	5.672	11.594*	4.973	9.949*	4.910	10.043*	4.871
Attendance Rate			209.382**	41.406	220.946**	42.725	233.212**	42.490
Percent Free and Reduced Lunch			-28.904**	3.374	-24.534**	3.451	-23.821**	3.487
Percent Minority Students			-2.293	2.232	-11.306**	3.295	-11.159**	3.276
Percent Male Students			-17.638	13.397	-21.558	13.251	-21.381	13.135
Percent Minority Teachers					7.062	8.918	3.827	8.902
Percent Male Teachers					-13.144*	5.898	-15.090*	5.870
Average Teacher Salary (District)					0.000**	.000	0.001**	.000
Student Teacher Ratio							-0.422**	.130
Average Expenditure per Student							-0.001**	.000
R <sup>2</sup>	0.379		0.533		0.549		0.558	
F for change in R <sup>2</sup>	49.664**		53.339**		7.616**		6.536**	

\*p<.05 \*\*p<.01

TABLE C-15. MODEL SUMMARY EXPLAINING MIDDLE SCHOOL STUDENT MATH ACHIEVEMENT BY TEACHING CONDITIONS CONSTRUCTS (N=198)

Variable	Model 1		Model 2		Model 3		Model 4	
	B	SE B	B	SE B	B	SE B	B	SE (B)
Intercept	-50.387**	12.016	-71.181**	26.077	-68.000*	26.189	12.616	33.117
TELL: Time	3.267	4.029	4.037	3.515	3.622	3.530	3.533	4.495
TELL: Community Support & Involvement	49.804**	4.270	26.141**	4.639	25.691**	4.668	11.856*	5.568
TELL: Facilities & Resources	6.208	4.435	5.297	3.819	5.398	3.822	-12.828*	5.356
TELL: Managing Student Conduct	5.432	3.774	7.102*	3.296	7.440*	3.306	9.680**	3.362
TELL: Teacher Leadership	-29.450**	7.420	-21.289**	6.585	-21.234**	6.588	-0.353	7.146
TELL: School Leadership	14.072	7.994	7.025	7.116	6.239	7.145	-13.252	9.086
TELL: Professional Development	-29.098**	5.871	-15.193**	5.328	-15.167**	5.345	-2.138	6.698
TELL: Instructional Practices & Support	9.253	8.190	6.111	7.305	6.55	7.314	7.044	8.583
Attendance Rate			83.577**	25.891	81.428**	25.945	104.834**	30.160
Percent Free and Reduced Lunch			-26.939**	4.699	-27.550**	4.777	-29.757**	5.481
Percent Minority Students			-8.956**	3.237	-6.013	4.823	-1.197	7.014
Percent Male Students			-15.42	8.833	-16.992	8.938	-70.287**	12.129
Percent Minority Teachers					-10.305	12.914	-15.439	23.263
Percent Male Teachers					7.193	5.851	6.446	7.426
R <sup>2</sup>	0.269		0.69		0.691		0.72	
F for change in R <sup>2</sup>	6.394**		45.835**		0.215		13.671**	

\*p&lt;.05 \*\*p&lt;.01

TABLE C-16. MODEL SUMMARY EXPLAINING HIGH SCHOOL STUDENT MATH ACHIEVEMENT BY TEACHING CONDITIONS CONSTRUCTS (N=147)

Variable	Model 1		Model 2		Model 3		Model 4	
	B	SE B	B	SE B	B	SE B	B	SE (B)
Intercept	-58.668*	24.756	17.372	28.686	2.013	29.328	7.747	26.376
TELL: Time	-18.724*	8.631	-7.713	8.508	-2.226	8.630	-1.938	7.756
TELL: Community Support & Involvement	37.858**	9.821	23.743*	9.994	20.174*	10.186	26.633**	9.223
TELL: Facilities & Resources	-9.515	10.158	-11.813	9.569	-14.92	9.517	-17.593*	8.566
TELL: Managing Student Conduct	11.433	6.676	13.431*	6.314	13.970*	6.195	11.423*	5.585
TELL: Teacher Leadership	-8.09	13.712	-4.092	13.026	-7.388	12.830	5.461	11.747
TELL: School Leadership	-6.829	17.903	-23.835	17.365	-24.251	17.112	-32.756*	15.450
TELL: Professional Development	-15.726	12.870	1.036	12.762	-0.513	12.683	7.723	11.489
TELL: Instructional Practices & Support	38.958*	16.860	31.346	15.963	41.313*	16.067	26.908	14.658
Percent Free and Reduced Lunch			-28.191**	9.104	-33.524**	9.198	-18.011*	8.701
Percent Minority Students			-0.009	8.637	-16.55	11.223	-5.784	10.260
Percent Male Students			-61.888**	19.078	-62.179**	18.790	-34.496	17.567
Percent Minority Teachers					93.285*	40.966	99.168**	36.830
Percent Male Teachers					15.243	12.430	17.524	11.178
Average Expenditure per Student							-0.003**	.000
R <sup>2</sup>	0.222		0.327		0.363		0.489	
F for change in R <sup>2</sup>	4.922**		7.021**		3.758		32.548**	

\*p<.05 \*\*p<.01



## Appendix D. Academic Growth

### Statewide Composite

#### Reading

Table D-1 presents information from the OLS model (1) where the outcome variable is academic growth (percentage of students demonstrating typical or higher annual growth) in reading, teaching conditions is a composite measure across all eight constructs, and the elementary, middle, and high school levels are combined. The unstandardized coefficient for the teaching conditions composite mean in the full model (Model 4) indicates that, after controlling for other student, teacher, and school-level variables, for every 1-point change in the teaching conditions mean, the percentage of students meeting or exceeding expected academic growth in reading increases more than 5 percentage points.

TABLE D-1. MODEL SUMMARY EXPLAINING STUDENT READING ACHIEVEMENT GROWTH BY OVERALL TEACHING CONDITIONS COMPOSITE (N=1,021)

Variable	Model 1		Model 2		Model 3		Model 4	
	B	SE B	B	SE B	B	SE B	B	SE (B)
Intercept	29.505**	3.249	48.952**	4.509	49.191**	5.390	50.733**	5.431
Teaching Conditions Composite Mean	9.468**	1.032	7.543**	.988	5.767**	1.013	5.593**	1.015
Percent Free and Reduced Lunch			-16.564**	1.335	-15.805**	1.362	-16.489**	1.398
Percent Minority Students			-1.258	1.141	-2.252	1.794	-2.279	1.791
Percent Male Students			-4.783	6.012	-5.33	5.916	-5.494	5.907
Percent Minority Teachers					-9.34	5.588	-10.7	5.616
Percent Male Teachers					-8.913**	1.657	-8.765**	1.655
Average Teacher Salary (District)					0.000*	.000	0.000**	.000
Student Teacher Ratio							-0.135*	.064
R <sup>2</sup>	0.076		0.213		0.242		0.246	
F for change in R <sup>2</sup>	83.814**		58.955**		12.919**		5.369**	

\*p<.05 \*\*p<.01

*Math*

Table D-2 presents information from the OLS model (1) where the outcome variable is academic growth (percent percentage of students demonstrating typical or higher annual growth) in math, teaching conditions is a composite measure across all eight constructs, and the elementary, middle, and high school levels are combined. The unstandardized coefficient for the teaching conditions composite mean in the full model (Model 4) indicates that, after controlling for other student, teacher, and school-level variables, for every 1-point change in the teaching conditions mean, the percentage of students meeting or exceeding expected academic growth in math increases more than 10 percentage points.

TABLE D-2. MODEL SUMMARY EXPLAINING STUDENT MATH ACHIEVEMENT GROWTH BY OVERALL TEACHING CONDITIONS COMPOSITE (N=1,021)								
Variable	Model 1		Model 2		Model 3		Model 4	
	B	SE B	B	SE B	B	SE B	B	SE (B)
Intercept	15.443**	4.464	-96.532**	25.055	-85.340**	31.102	-88.078**	31.002
Teaching Conditions Composite Mean	14.137**	1.418	11.854**	1.461	10.750**	1.487	10.373**	1.487
Attendance Rate			134.004**	25.651	112.025**	30.325	117.642**	30.275
Percent Free and Reduced Lunch			-6.947**	2.196	-6.072*	2.391	-7.112**	2.409
Percent Minority Students			-0.668	1.804	-2.216	2.897	-1.913	2.888
Percent Male Students			-6.562	8.677	-7.62	8.654	-7.719	8.622
Percent Minority Teachers					-5.15	8.227	-7.079	8.224
Percent Male Teachers					-4.929	2.811	-4.309	2.809
Average Years of Teaching Experience					0.202	.131	0.298*	.135
Average Teacher Salary (District)					0.000*	.000	0.000**	.000
Student Teacher Ratio							-0.280**	.096
R <sup>2</sup>	0.089		0.15		0.163		0.17	
F for change in R <sup>2</sup>	99.551**		18.210**		3.926**		8.518**	
*p<.05 **p<.01								



**Statewide by TELL Construct**

*Reading*

Models at the state level that included the individual teaching conditions constructs show that Community Support and Involvement and Managing Student Conduct have a significant and consistently positive association with academic growth in reading. Professional Development has a significant and negative association with student academic growth in reading. See Table D-3.

TABLE D-3. MODEL SUMMARY EXPLAINING STUDENT READING ACHIEVEMENT GROWTH BY TEACHING CONDITIONS CONSTRUCTS (N=1,021)

Variable	Model 1		Model 2		Model 3		Model 4	
	B	SE B	B	SE B	B	SE B	B	SE (B)
Intercept	30.190**	4.105	42.575**	5.356	40.731**	6.228	7.747	26.376
TELL: Time	0.139	1.421	0.583	1.407	1.774	1.433	-1.938	7.756
TELL: Community Support & Involvement	15.866**	1.436	9.490**	1.634	7.388**	1.724	26.633**	9.223
TELL: Facilities & Resources	0.697	1.613	0.796	1.573	1.334	1.570	-17.593*	8.566
TELL: Managing Student Conduct	4.197**	1.293	4.863**	1.269	3.779**	1.294	11.423*	5.585
TELL: Teacher Leadership	-1.804	2.548	-1.914	2.508	-1.968	2.492	5.461	11.747
TELL: School Leadership	-2.433	2.894	-2.344	2.858	-0.944	2.868	-32.756*	15.450
TELL: Professional Development	-7.495**	2.046	-3.732	2.073	-5.176*	2.112	7.723	11.489
TELL: Instructional Practices & Support	-0.061	2.925	0.023	2.856	0.343	2.838	26.908	14.658
Percent Free and Reduced Lunch			-11.358**	1.556	-11.593**	1.616	-18.011*	8.701
Percent Minority Students			-0.709	1.162	-1.451	1.786	-5.784	10.260
Percent Male Students			-0.841	5.893	-2.201	5.865	-34.496	17.567
Percent Minority Teachers					-8.834	5.519	99.168**	36.830
Percent Male Teachers					-5.733**	1.852	17.524	11.178
Average Teacher Salary (District)					0.000*	.000	-0.003**	.000
R <sup>2</sup>	0.214		0.257		0.269		0.489	
F for change in R <sup>2</sup>	34.441**		19.465**		5.505**		32.548**	

\*p<.05 \*\*p<.01

*Math*

Models at the state level that included the individual teaching conditions constructs show that Community Support and Involvement, Managing Student Conduct, and Instructional Practices and Support have a significant and consistently positive association with academic growth in math. Professional Development has a significant and negative association with student academic growth in math. See Table D-4.

TABLE D-4. MODEL SUMMARY EXPLAINING STUDENT MATH ACHIEVEMENT GROWTH BY TEACHING CONDITIONS CONSTRUCTS (N=1,021)

Variable	Model 1		Model 2		Model 3		Model 4	
	B	SE B	B	SE B	B	SE B	B	SE (B)
Intercept	8.228	5.895	-72.427**	26.176	-79.915*	31.232	-81.876**	31.174
TELL: Time	-2.617	2.040	-0.79	2.065	0.148	2.100	-0.339	2.105
TELL: Community Support & Involvement	14.255**	2.062	9.429**	2.447	8.097**	2.535	7.493**	2.543
TELL: Facilities & Resources	1.903	2.317	1.353	2.299	1.83	2.307	1.982	2.303
TELL: Managing Student Conduct	4.944**	1.857	4.448*	1.887	3.925*	1.905	4.020*	1.901
TELL: Teacher Leadership	-2.281	3.659	-4.139	3.666	-4.328	3.655	-4.617	3.649
TELL: School Leadership	-1.565	4.156	1.619	4.192	3.101	4.211	3.563	4.207
TELL: Professional Development	-7.419*	2.939	-6.029*	3.038	-8.212**	3.112	-8.141**	3.105
TELL: Instructional Practices & Support	8.661*	4.201	8.883*	4.173	9.208*	4.162	9.565*	4.155
Attendance Rate			93.015**	27.022	89.358**	30.619	93.743**	30.608
Percent Free and Reduced Lunch			-3.498	2.403	-2.579	2.641	-3.74	2.681
Percent Minority Students			1.321	1.873	-1.474	2.822	-1.695	2.817
Percent Male Students			-3.646	8.621	-4.808	8.626	-5.057	8.608
Percent Minority Teachers					-7.08	8.111	-9.136	8.141
Percent Male Teachers					-2.567	3.026	-2.167	3.024
Average Teacher Salary (District)					0.000**	.000	0.000**	.000
Student Teacher Ratio							-0.220*	.094
R <sup>2</sup>	0.153		0.172		0.18		0.185	
F for change in R <sup>2</sup>	22.851**		5.783**		3.268*		6.160*	

\*p<.05 \*\*p<.01

## School Level Composite

### Reading

Reading academic growth is significantly higher at the elementary and middle school levels where teachers perceive there are better teaching conditions. Tables D-5–D-7 present the models predicting reading academic growth for elementary, middle, and high school. Statistically significant coefficients are denoted with asterisks.

TABLE D-5. MODEL SUMMARY EXPLAINING ELEMENTARY SCHOOL STUDENT READING ACHIEVEMENT GROWTH BY OVERALL TEACHING CONDITIONS (N=666)

Variable	Model 1		Model 2		Model 3		Model 4	
	B	SE B	B	SE B	B	SE B	B	SE (B)
Intercept	30.959**	4.243	53.411**	6.744	53.495**	6.752	34.27	19.424
Teaching Conditions Composite Mean	9.130**	1.331	5.915**	1.310	5.904**	1.313	17.625**	5.474
Percent Free and Reduced Lunch			-16.261**	1.633	-15.999**	1.703	-25.072**	7.994
Percent Minority Students			-3.255*	1.396	-2.403	2.090	-10.968	10.113
Percent Male Students			-1.389	9.925	-1.528	9.937	-31.247	16.940
Percent Minority Teachers					-3.679	6.423	115.464**	35.712
Percent Male Teachers					-1.916	4.332		
$R^2$	0.066		0.213		0.213		0.417	
F for change in $R^2$	46.921**		41.155**		0.000		31.949**	
* $p < .05$ ** $p < .01$								





TABLE D-6. MODEL SUMMARY EXPLAINING MIDDLE SCHOOL STUDENT READING ACHIEVEMENT GROWTH BY OVERALL TEACHING CONDITIONS (N=197)

Variable	Model 1		Model 2		Model 3		Model 4	
	B	SE B	B	SE B	B	SE B	B	SE (B)
Intercept	29.202**	6.556	-66.366	41.146	-49.332	41.985	34.27	19.424
Teaching Conditions Composite Mean	9.668**	2.120	4.988**	1.852	4.068*	1.878	17.625**	5.474
Attendance Rate			130.831**	41.918	115.581**	42.663	-25.072**	7.994
Percent Free and Reduced Lunch			-12.117**	3.220	-12.870**	3.197	-10.968	10.113
Percent Minority Students			-6.766**	2.195	-0.822	3.467	-31.247	16.940
Percent Male Students			-10.612	6.138	-13.456*	6.171	115.464**	35.712
Percent Minority Teachers					-20.177*	9.256	5.237	11.111
Percent Male Teachers					6.968	4.265	-0.003**	.000
R <sup>2</sup>	0.096		0.389		0.409		0.417	
F for change in R <sup>2</sup>	20.708**		22.898**		3.198*		31.949**	
*p<.05 **p<.01								



TABLE D-7. MODEL SUMMARY EXPLAINING HIGH SCHOOL STUDENT READING ACHIEVEMENT GROWTH BY OVERALL TEACHING CONDITIONS (N=144)

Variable	Model 1		Model 2		Model 3		Model 4	
	B	SE B	B	SE B	B	SE B	B	SE (B)
Intercept	39.935**	9.313	72.080**	14.380	55.076**	16.694	50.733**	5.431
Teaching Conditions Composite Mean	5.258	3.071	1.094	2.721	-0.691	2.760	5.593**	1.015
Percent Free and Reduced Lunch			-28.500**	4.038	-28.152**	3.977	-16.489**	1.398
Percent Minority Students			8.599*	4.037	4.855	5.884	-2.279	1.791
Percent Male Students			-6.904	21.102	-6.431	20.819	-5.494	5.907
Percent Minority Teachers					-19.649	22.195	-10.7	5.616
Percent Male Teachers					-7.298	6.090	-8.765**	1.655
Average Years of Teaching Experience					-0.597*	.283	0.000**	.000
Average Teacher Salary (District)					0.001**	.000	-0.135*	.064
R <sup>2</sup>	0.02		0.291		0.351		0.246	
F for change in R <sup>2</sup>	2.898*		17.710**		3.120*		5.369**	
*p<.05 **p<.01								

*Math*

Academic growth in math is higher at all school levels where teachers perceive there are better teaching conditions. Tables D-8–D-10 present the models predicting math academic growth for elementary, middle, and high school. Statistically significant coefficients are denoted with asterisks.

**TABLE D-8. MODEL SUMMARY EXPLAINING ELEMENTARY SCHOOL STUDENT MATH ACHIEVEMENT GROWTH BY OVERALL TEACHING CONDITIONS (N=666)**

Variable	Model 1		Model 2		Model 3		Model 4	
	B	SE B	B	SE B	B	SE B	B	SE (B)
Intercept	24.842**	5.924	41.429**	10.095	28.365*	11.305	31.960**	11.398
Teaching Conditions Composite Mean	11.465**	1.858	10.457**	1.961	9.658**	1.973	9.290**	1.975
Percent Free and Reduced Lunch			-10.758**	2.444	-9.364**	2.685	-10.635**	2.742
Percent Minority Students			1.167	2.090	0.272	3.334	0.114	3.326
Percent Male Students			-12.54	14.855	-15.193	14.846	-15.673	14.808
Percent Minority Teachers					-16.676	10.141	-19.347	10.190
Percent Male Teachers					6.242	6.495	5.111	6.499
Average Teacher Salary (District)					0.000*	.000	0.000**	.000
Student Teacher Ratio							-0.303*	.141
R <sup>2</sup>	0.054		0.083		0.095		0.101	
F for change in R <sup>2</sup>	37.903**		6.968**		2.908*		4.385*	
*p<.05 **p<.01								



TABLE D-9. MODEL SUMMARY EXPLAINING MIDDLE SCHOOL STUDENT MATH ACHIEVEMENT GROWTH BY OVERALL TEACHING CONDITIONS (N=190)

Variable	Model 1		Model 2		Model 3		Model 4	
	B	SE B	B	SE B	B	SE B	B	SE (B)
Intercept	18.631*	8.996	52.099**	10.636	70.920**	13.716	78.733**	13.870
Teaching Conditions Composite Mean	13.023**	2.903	8.821**	2.855	8.832**	2.889	8.812**	2.847
Percent Free and Reduced Lunch			-14.582**	3.837	-16.472**	4.065	-14.245**	4.103
Percent Minority Students			-6.612*	3.279	2.327	5.365	3.736	5.317
Percent Male Students			-20.166*	9.279	-20.146*	9.312	-21.191*	9.187
Percent Minority Teachers					4.936	15.123	5.319	14.906
Percent Male Teachers					2.676	6.546	1.839	6.460
Average Years of Teaching Experience					0.473*	.229	0.464*	.226
Average Teacher Salary (District)					-0.001**	.000	-0.001**	.000
Average Expenditure per Student							-0.001*	.000
R <sup>2</sup>	0.097		0.226		0.262		0.287	
F for change in R <sup>2</sup>	20.195**		10.278**		2.207		6.311	
*p<.05 **p<.01								



TABLE D-10. MODEL SUMMARY EXPLAINING HIGH SCHOOL STUDENT MATH ACHIEVEMENT GROWTH BY OVERALL TEACHING CONDITIONS (N=144)

Variable	Model 1		Model 2		Model 3		Model 4	
	B	SE B	B	SE B	B	SE B	B	SE (B)
Intercept	5.821	11.618	19.214	17.638	21.903	18.167	34.27	19.424
Teaching Conditions Composite Mean	16.002**	3.832	11.203**	3.338	11.771**	3.398	17.625**	5.474
Percent Free and Reduced Lunch			-36.601**	4.953	-35.689**	4.956	-25.072**	7.994
Percent Minority Students			9.765	4.952	0.446	7.235	-10.968	10.113
Percent Male Students			42.529	25.883	36.814	25.960	-31.247	16.940
Percent Minority Teachers					45.411	25.516	115.464**	35.712
Percent Male Teachers					-5.007	7.613		
R <sup>2</sup>	0.109		0.377		0.392		0.417	
F for change in R <sup>2</sup>	17.371**		19.932**		1.690		31.949**	

\*p<.05 \*\*p<.01

## School Level by TELL Construct

### Reading

At the elementary and middle school level, Community Support and Involvement and Managing Student Conduct constructs have a statistically significant and positive relationship with academic growth in reading. Community Support and Involvement was a statistically significant predictor of reading academic growth at the high school level in the first model but was no longer significant once additional variables were added in Models 2 and 3. At the middle school level, Time was a statistically significant positive predictor of academic growth in reading whereas Teacher Leadership was significant and negative. See Tables D-11–D-13.

TABLE D-11. MODEL SUMMARY EXPLAINING ELEMENTARY STUDENT READING ACHIEVEMENT GROWTH BY TEACHING CONDITIONS CONSTRUCTS (N=666)

Variable	Model 1		Model 2		Model 3		Model 4	
	B	SE B	B	SE B	B	SE B	B	SE (B)
Intercept	30.095**	5.300	46.228**	8.008	46.336**	8.023	7.747	26.376
TELL: Time	0.162	1.855	1.762	1.869	1.778	1.872	-1.938	7.756
TELL: Community Support & Involvement	15.931**	1.873	7.548**	2.344	7.599**	2.350	26.633**	9.223
TELL: Facilities & Resources	-0.746	2.093	0.128	2.053	0.115	2.057	-17.593*	8.566
TELL: Managing Student Conduct	4.696**	1.818	3.910*	1.800	3.783*	1.822	11.423*	5.585
TELL: Teacher Leadership	-2.301	3.293	-2.356	3.240	-2.293	3.249	5.461	11.747
TELL: School Leadership	-0.581	3.718	1.225	3.687	1.214	3.693	-32.756*	15.450
TELL: Professional Development	-6.491*	2.689	-4.398	2.677	-4.358	2.683	7.723	11.489
TELL: Instructional Practices & Support	-1.561	3.797	-1.205	3.717	-1.229	3.730	26.908	14.658
Percent Free and Reduced Lunch			-11.620**	2.129	-11.429**	2.191	-18.011*	8.701
Percent Minority Students			-1.737	1.449	-1.365	2.102	-5.784	10.260
Percent Male Students			0.755	9.874	0.636	9.891	-34.496	17.567
Percent Minority Teachers					-1.729	6.406	99.168**	36.830
Percent Male Teachers					-1.485	4.325	17.524	11.178
R <sup>2</sup>	0.197		0.236		0.237		0.489	
F for change in R <sup>2</sup>	20.148**		11.128**		0.427		32.548**	

\*p<.05 \*\*p<.01

TABLE D-12. MODEL SUMMARY EXPLAINING MIDDLE SCHOOL STUDENT READING ACHIEVEMENT GROWTH BY TEACHING CONDITIONS CONSTRUCTS (N=197)

Variable	Model 1		Model 2		Model 3		Model 4	
	B	SE B	B	SE B	B	SE B	B	SE (B)
Intercept	29.601**	7.502	-49.672	40.211	-29.189	40.766	7.747	26.376
TELL: Time	6.980**	2.481	5.845*	2.394	5.371*	2.365	-1.938	7.756
TELL: Community Support & Involvement	18.349**	2.604	8.944**	3.102	9.156**	3.065	26.633**	9.223
TELL: Facilities & Resources	1.581	2.674	0.667	2.552	0.99	2.512	-17.593*	8.566
TELL: Managing Student Conduct	5.797*	2.336	6.370**	2.223	6.507**	2.186	11.423*	5.585
TELL: Teacher Leadership	-11.485*	4.576	-9.093*	4.400	-9.436*	4.328	5.461	11.747
TELL: School Leadership	0.809	5.000	-0.54	4.799	-1.367	4.731	-32.756*	15.450
TELL: Professional Development	9.777**	3.679	-4.845	3.573	-4.103	3.524	7.723	11.489
TELL: Instructional Practices & Support	-2.193	5.229	-1.149	4.956	-1.645	4.877	26.908	14.658
Attendance Rate			104.642*	41.490	85.363*	42.005	-18.011*	8.701
Percent Free and Reduced Lunch			-7.762*	3.562	-8.296*	3.512	-5.784	10.260
Percent Minority Students			-4.400*	2.187	2.339	3.322	-34.496	17.567
Percent Male Students			-5.453	5.902	8.392	5.894	99.168**	36.830
Percent Minority Teachers					-23.381**	8.802	17.524	11.178
Percent Male Teachers					6.128	4.025	-0.003**	.000
R <sup>2</sup>	0.391		0.476		0.499		0.489	
F for change in R <sup>2</sup>	15.088**		7.462**		4.178*		32.548**	
*p<.05 **p<.01								



TABLE D-13. MODEL SUMMARY EXPLAINING HIGH SCHOOL STUDENT READING ACHIEVEMENT GROWTH BY TEACHING CONDITIONS CONSTRUCTS (N=144)

Variable	Model 1		Model 2		Model 3		Model 4	
	B	SE B	B	SE B	B	SE B	B	SE (B)
Intercept	32.843**	12.170	64.751**	16.943	69.387**	17.688	7.747	26.376
TELL: Time	-5.002	4.655	-1.127	4.232	-0.829	4.260	-1.938	7.756
TELL: Community Support & Involvement	13.211**	4.504	0.117	4.724	-0.635	4.823	26.633**	9.223
TELL: Facilities & Resources	8.49	4.832	6.423	4.353	7.241	4.451	-17.593*	8.566
TELL: Managing Student Conduct	1.943	3.162	2.383	2.851	2.151	2.872	11.423*	5.585
TELL: Teacher Leadership	4.462	6.998	2.069	6.382	1.83	6.473	5.461	11.747
TELL: School Leadership	-9.923	9.308	-11.46	8.489	-10.784	8.683	-32.756*	15.450
TELL: Professional Development	-8.623	6.113	0.349	5.770	0.183	5.805	7.723	11.489
TELL: Instructional Practices & Support	2.713	8.182	4.719	7.378	3.771	7.471	26.908	14.658
Percent Free and Reduced Lunch			-28.649**	5.015	-28.790**	5.085	-18.011*	8.701
Percent Minority Students			7.973	4.160	7.186	6.031	-5.784	10.260
Percent Male Students			-6.776	21.732	-7.681	21.952	-34.496	17.567
Percent Minority Teachers					4.829	21.580	99.168**	36.830
Percent Male Teachers					-6.425	6.579	17.524	11.178
R <sup>2</sup>	0.133		0.317		0.322		0.489	
F for change in R <sup>2</sup>	2.589**		11.854**		0.479		32.548**	
*p<.05 **p<.01								



*Math*

Before accounting for additional variables, the Community Support and Involvement construct had a statistically significant and positive relationship with academic growth in math at all school levels. However, once all of the additional variables were added, Community Support and Involvement only held as a statistically significant predictor of reading academic growth at the middle school level. Also at the middle school level, Managing Student Conduct is a statistically significant positive predictor of academic growth in reading. Professional Development is a statistically significant and negative predictor of academic growth in reading at the elementary and middle school levels. At the high school level, School Leadership is significant and negative. Tables D-14–D-16 present these results.

TABLE D-14. MODEL SUMMARY EXPLAINING ELEMENTARY STUDENT MATH ACHIEVEMENT GROWTH BY TEACHING CONDITIONS CONSTRUCTS (N=666)

Variable	Model 1		Model 2		Model 3		Model 4	
	B	SE B	B	SE B	B	SE B	B	SE (B)
Intercept	15.126	7.841	26.484*	12.080	12.12	12.971	14.888	12.976
TELL: Time	-1.597	2.745	0.228	2.820	1.099	2.825	0.518	2.825
TELL: Community Support & Involvement	9.640**	2.771	4.843	3.537	3.989	3.529	4.015	3.516
TELL: Facilities & Resources	0.5	3.096	0.707	3.097	0.711	3.082	0.967	3.073
TELL: Managing Student Conduct	2.194	2.689	2.407	2.716	2.718	2.729	2.789	2.719
TELL: Teacher Leadership	-4.351	4.872	-5.367	4.887	-5.881	4.867	-6.503	4.857
TELL: School Leadership	5.647	5.502	8.006	5.562	9.012	5.545	9.589	5.531
TELL: Professional Development	-8.227*	3.978	-7.946*	4.038	-9.802*	4.073	-10.166*	4.062
TELL: Instructional Practices & Support	9.998	5.617	10.459	5.607	10.408	5.591	10.881	5.574
Percent Free and Reduced Lunch			-7.731*	3.212	-6.485	3.377	-7.761*	3.407
Percent Minority Students			2.768	2.186	1.418	3.352	1.271	3.340
Percent Male Students			-9.782	14.896	-12.983	14.872	-13.208	14.818
Percent Minority Teachers					-16.64	10.145	-19.511	10.180
Percent Male Teachers					6.985	6.525	5.82	6.519
Average Teacher Salary (District)					0.000**	.000	0.000**	.000
Student Teacher Ratio							-0.338*	.141
R <sup>2</sup>	0.087		0.097		0.111		0.119	
F for change in R <sup>2</sup>	7.826**		2.414		3.417*		5.902*	
*p<.05 **p<.01								



TABLE D-15. MODEL SUMMARY EXPLAINING MIDDLE SCHOOL STUDENT MATH ACHIEVEMENT GROWTH BY TEACHING CONDITIONS CONSTRUCTS (N=190)

Variable	Model 1		Model 2		Model 3		Model 4	
	B	SE B	B	SE B	B	SE B	B	SE (B)
Intercept	10.998	10.731	26.114*	12.961	42.494**	15.891	48.455**	15.928
TELL: Time	1.964	3.645	0.913	3.695	0.244	3.704	0.677	3.667
TELL: Community Support & Involvement	18.352**	3.690	14.369**	4.676	14.881**	4.678	15.406**	4.630
TELL: Facilities & Resources	6.136	3.829	6.685	3.831	6.018	3.844	6.746	3.813
TELL: Managing Student Conduct	9.892**	3.346	9.408**	3.360	9.767**	3.354	8.148*	3.392
TELL: Teacher Leadership	-14.119*	6.461	-12.372	6.593	-11.809	6.587	-11.396	6.514
TELL: School Leadership	0.635	7.284	-0.12	7.450	-1.453	7.462	-0.114	7.400
TELL: Professional Development	-14.679**	5.222	-12.570*	5.318	-10.284	5.418	-11.105*	5.369
TELL: Instructional Practices & Support	7.057	7.609	6.986	7.637	5.496	7.647	4.636	7.568
Percent Free and Reduced Lunch			-3.632	4.577	-5.017	4.789	-2.837	4.832
Percent Minority Students			-4.573	3.243	1.763	4.957	2.678	4.917
Percent Male Students			-12.314	8.836	-13.685	8.939	-14.813	8.851
Percent Minority Teachers					-7.165	14.094	-6.335	13.937
Percent Male Teachers					1.002	6.141	0.26	6.079
Average Teacher Salary (District)					0	.000	0	.000
Average Expenditure per Student							0.001*	.000
R <sup>2</sup>	0.336		0.353		0.368		0.386	
F for change in R <sup>2</sup>	11.449**		1.559		1.384		5.101*	
*p<.05 **p<.01								



TABLE D-16. MODEL SUMMARY EXPLAINING HIGH SCHOOL STUDENT MATH ACHIEVEMENT GROWTH BY TEACHING CONDITIONS CONSTRUCTS (N=144)

Variable	Model 1		Model 2		Model 3		Model 4	
	B	SE B	B	SE B	B	SE B	B	SE (B)
Intercept	-4.05	14.725	3.71	20.306	3.819	21.101	7.747	26.376
TELL: Time	0.749	5.633	3.514	5.072	3.769	5.082	-1.938	7.756
TELL: Community Support & Involvement	23.896**	5.449	10.663	5.661	11.065	5.753	26.633**	9.223
TELL: Facilities & Resources	4.939	5.846	2.504	5.216	2.594	5.310	-17.593*	8.566
TELL: Managing Student Conduct	4.379	3.826	4.613	3.417	4.497	3.427	11.423*	5.585
TELL: Teacher Leadership	9.438	8.467	5.199	7.648	3.572	7.722	5.461	11.747
TELL: School Leadership	-24.711*	11.262	-25.102*	10.173	-22.230*	10.358	-32.756*	15.450
TELL: Professional Development	-10.56	7.396	0.562	6.915	-0.087	6.925	7.723	11.489
TELL: Instructional Practices & Support	12.957	9.900	13.777	8.842	13.156	8.913	26.908	14.658
Percent Free and Reduced Lunch			-33.492**	6.010	-32.361**	6.066	-18.011*	8.701
Percent Minority Students			8.47	4.986	0.818	7.194	-5.784	10.260
Percent Male Students			46.813	26.044	42.597	26.187	-34.496	17.567
Percent Minority Teachers					38.01	25.743	99.168**	36.830
Percent Male Teachers					-1.738	7.848	17.524	11.178
R <sup>2</sup>	0.259		0.427		0.437		0.489	
F for change in R <sup>2</sup>	5.898**		12.901**		1.155		32.548**	
*p<.05 **p<.01								

## Appendix E. Teacher Retention

### Statewide Composite

The results presented in Table E-1 demonstrate that the relationship between teachers' perceptions of their school's teaching conditions and the teacher retention rate is statistically significant and positive prior to adding teacher and school-level variables to the model. As shown in Model 4 of Table E-1, multiple variables are statistically significant predictors of teacher retention.

TABLE E-1. MODEL SUMMARY EXPLAINING TEACHER RETENTION BY OVERALL TEACHING CONDITIONS (N=1,090)

Variable	Model 1		Model 2		Model 3		Model 4	
	B	SE B	B	SE B	B	SE B	B	SE (B)
Intercept	0.617**	.042	0.04	.112	0.218*	.110	0.189	.109
Teaching Conditions Composite Mean	0.067**	.013	0.036**	.013	0.008	.012	0.018	.012
Attendance Rate			0.757**	.104	0.645**	.099	0.562**	.099
Percent Free and Reduced Lunch			0.024	.019	0.058**	.016	0.086**	.017
Percent Minority Students			-0.114**	.015	-0.047*	.020	-0.058**	.020
Percent Male Students			-0.063	.047	-0.083*	.041	-0.033	.042
Percent Minority Teachers					-0.048	.056	-0.051	.056
Percent Male Teachers					-0.052**	.019	-0.067**	.019
Average Years of Teaching Experience					0.004**	.001	0.004**	.001
Percent First Year Teachers					0.681**	.046	-0.677**	.045
Total Membership							0.000**	.000
R <sup>2</sup>	0.023		0.113		0.35		0.363	
F for change in R <sup>2</sup>	25.613**		27.497**		98.446**		22.020**	
*p<.05 **p<.01								

**Statewide by TELL Construct**

Models at the state level that included the individual teaching conditions constructs show that Teacher Leadership has a significant and consistently positive association with teacher retention. Community Support and Involvement and Managing Student Conduct were also found to have a positive influence on teacher retention prior to adding the teacher and school-level variables in Models 3 and 4. Time has a significant and negative association with teacher retention. See Table E-2.

**TABLE E-2. MODEL SUMMARY EXPLAINING TEACHER RETENTION BY TEACHING CONDITIONS CONSTRUCTS (N=1,090)**

Variable	Model 1		Model 2		Model 3		Model 4	
	B	SE B	B	SE B	B	SE B	B	SE (B)
Intercept	0.631**	.055	0.146	.115	0.195	.113	0.169	.112
TELL: Time	0.065**	.018	-0.060**	.018	-0.048**	.016	-0.036*	.016
TELL: Community Support & Involvement	0.085**	.019	0.066**	.020	0.02	.018	0.023	.018
TELL: Facilities & Resources	-0.013	.022	-0.017	.021	0.004	.018	-0.004	.018
TELL: Managing Student Conduct	0.048**	.017	0.033*	.017	0.017	.015	0.019	.015
TELL: Teacher Leadership	0.009	.033	0.05	.032	0.063*	.028	0.068*	.028
TELL: School Leadership	0.006	.038	-0.038	.037	-0.042	.032	-0.04	.032
TELL: Professional Development	-0.009	.027	0.033	.027	-0.022	.024	-0.026	.023
TELL: Instructional Practices & Support	-0.001	.038	0.044	.037	0.019	.033	0.015	.032
Attendance Rate			0.644**	.107	0.614**	.100	0.542**	.101
Percent Free and Reduced Lunch			0.057**	.020	0.077**	.018	0.107**	.019
Percent Minority Students			-0.118**	.015	-0.045*	.020	-0.054**	.020
Percent Male Students			-0.029	.048	-0.063	.042	-0.016	.043
Percent Minority Teachers					-0.059	.056	-0.059	.056
Percent Male Teachers					-0.031	.021	-0.047*	.021
Average Years of Teaching Experience					0.004**	.001	0.005**	.001
Percent First Year Teachers					-0.672**	.046	-0.670**	.045
Total Membership							0.000**	.000
R <sup>2</sup>	0.077		0.143		0.36		0.373	
F for change in R <sup>2</sup>	11.273**		20.736**		90.954**		22.226**	

\*p<.05 \*\*p<.01

### School Level Composite

Overall teaching conditions are not found to be significantly associated with teacher retention at the elementary, middle, or high school level when other student, teacher, and school-level variables are considered. (See Tables E-3–E-5.)

TABLE E-3. MODEL SUMMARY EXPLAINING ELEMENTARY SCHOOL TEACHER RETENTION BY OVERALL TEACHING CONDITIONS (N=676)

Variable	Model 1		Model 2		Model 3		Model 4	
	B	SE B	B	SE B	B	SE B	B	SE (B)
Intercept	0.678**	.046	-0.046	.348	-0.225	.302	-0.388	.303
Teaching Conditions Composite Mean	0.054**	.014	0.021	.015	0.016	.013	0.019	.013
Attendance Rate			0.883*	.344	1.022**	.298	1.081**	.296
Percent Free and Reduced Lunch			0.028	.025	0.072**	.021	0.092**	.023
Percent Minority Students			-0.114**	.018	-0.071**	.023	-0.102**	.024
Percent Male Students			-0.014	.096	0.035	.081	0.061	.081
Percent Minority Teachers					0.079	.063	0.088	.062
Percent Male Teachers					-0.017	.041	0.007	.041
Average Years of Teaching Experience					0.004**	.001	0.003**	.001
Percent First Year Teachers					-0.684**	.050	-0.675**	.050
Average Expenditure per Student							0.000**	.000
Total Membership							0.000**	.000
R <sup>2</sup>	0.02		0.079		0.365		0.381	
F for change in R <sup>2</sup>	13.755**		10.730**		74.991**		8.582**	

\*p<.05 \*\*p<.01



**TABLE E-4. MODEL SUMMARY EXPLAINING MIDDLE SCHOOL TEACHER RETENTION BY OVERALL TEACHING CONDITIONS (N=198)**

Variable	Model 1		Model 2		Model 3		Model 4	
	B	SE B	B	SE B	B	SE B	B	SE (B)
Intercept	0.651**	.120	0.963**	.140	0.869**	.129	0.743**	.127
Teaching Conditions Composite Mean	0.048	.039	-0.016	.037	-0.014	.033	-0.015	.032
Percent Free and Reduced Lunch			-0.163**	.050	-0.074	.045	-0.009	.046
Percent Minority Students			-0.181**	.043	-0.137*	.060	-0.156**	.057
Percent Male Students			0.034	.117	0.073	.102	0.108	.098
Percent Minority Teachers					0.18	.162	0.055	.158
Percent Male Teachers					-0.013	.071	-0.015	.068
Average Years of Teaching Experience					0.005	.003	0.005	.003
Percent First Year Teachers					-0.718**	.114	-0.713**	.109
Total Membership							0.000**	.000
R <sup>2</sup>	0.008		0.172		0.396		0.449	
F for change in R <sup>2</sup>	1.581		12.742**		17.523**		18.083**	
*p<.05 **p<.01								

TABLE E-5. MODEL SUMMARY EXPLAINING HIGH SCHOOL TEACHER RETENTION  
 BY OVERALL TEACHING CONDITIONS (N=156)

Variable	Model 1		Model 2		Model 3		Model 4	
	B	SE B	B	SE B	B	SE B	B	SE (B)
Intercept	0.645**	.114	0.783**	.123	0.726**	.106	0.743**	.127
Teaching Conditions Composite Mean	0.053	.037	0.078*	.038	0.039	.029	-0.015	.032
Percent Free and Reduced Lunch			-0.036	.052	0.075	.043	-0.009	.046
Percent Minority Students			-0.057	.059	0.141*	.055	-0.156**	.057
Percent Male Students			-0.346**	.111	-0.412**	.101	0.108	.098
Percent Minority Teachers					-0.531**	.174	0.055	.158
Percent Male Teachers					0.225**	.060	-0.015	.068
Average Years of Teaching Experience					0.011**	.003	0.005	.003
Percent First Year Teachers					-0.565**	.118	-0.713**	.109
Average Expenditure per Student					-0.000**	.000	0.000**	.000
R <sup>2</sup>	0.013		0.113		0.51		0.449	
F for change in R <sup>2</sup>	2.028		5.675**		23.658**		18.083**	
*p<.05 **p<.01								



### School Level by TELL Construct

At the elementary school level, the Facilities and Resources construct is significantly and negatively associated with a teacher’s decision to continue teaching. At the middle school level, Time and Professional Development are negatively related to teacher retention. At the high school level, a negative association is found between Community Support and Involvement and teacher retention. See Tables E-6–E-8 for elementary, middle, and high school level models.

TABLE E-6. MODEL SUMMARY EXPLAINING ELEMENTARY SCHOOL TEACHER RETENTION BY TEACHING CONDITIONS CONSTRUCTS (N=676)

Variable	Model 1		Model 2		Model 3		Model 4	
	B	SE B	B	SE B	B	SE B	B	SE (B)
Intercept	0.704**	.061	-0.229	.357	-0.217	.310	-0.392	.308
TELL: Time	-0.01	.022	-0.025	.022	0.006	.018	0.01	.018
TELL: Community Support & Involvement	0.055*	.021	0.054*	.026	0.017	.022	0.015	.022
TELL: Facilities & Resources	-0.059*	.024	-0.066**	.024	-0.041*	.020	-0.049*	.020
TELL: Managing Student Conduct	0.029	.021	0.003	.021	0.016	.018	0.018	.018
TELL: Teacher Leadership	0.044	.038	0.06	.037	0.039	.031	0.049	.031
TELL: School Leadership	-0.017	.043	-0.036	.042	-0.034	.036	-0.038	.035
TELL: Professional Development	-0.014	.031	0.03	.032	-0.026	.027	-0.032	.026
TELL: Instructional Practices & Support	0.017	.043	0.004	.043	0.042	.036	0.046	.035
Attendance Rate			1.044**	.353	0.994**	.306	1.057**	.302
Percent Free and Reduced Lunch			0.072*	.029	0.084**	.025	0.107**	.026
Percent Minority Students			-0.117**	.019	0.064**	.023	-0.098**	.024
Percent Male Students			0.019	.098	0.052	.083	0.081	.082
Percent Minority Teachers					0.076	.063	0.085	.062
Percent Male Teachers					-0.013	.041	0.014	.041
Average Years of Teaching Experience					0.003*	.001	0.003*	.001
Percent First Year Teachers					-0.692**	.051	-0.684**	.050
Average Expenditure per Student							0.000**	.000
Total Membership							0.000**	.000
R <sup>2</sup>	0.053		0.103		0.376		0.396	
F for change in R <sup>2</sup>	4.666**		9.239**		72.078**		10.877**	
*p<.05 **p<.01								



TABLE E-7. MODEL SUMMARY EXPLAINING MIDDLE SCHOOL TEACHER RETENTION BY TEACHING CONDITIONS CONSTRUCTS (N=198)

Variable	Model 1		Model 2		Model 3		Model 4	
	B	SE B	B	SE B	B	SE B	B	SE (B)
Intercept	0.695**	.150	0.855**	.177	0.575**	.176	7.747	26.376
TELL: Time	-0.049	.050	-0.086	.049	-0.093*	.047	-1.938	7.756
TELL: Community Support & Involvement	0.167**	.054	0.105	.064	0.08	.061	26.633**	9.223
TELL: Facilities & Resources	-0.04	.056	-0.022	.053	-0.006	.051	-17.593*	8.566
TELL: Managing Student Conduct	0.041	.048	0.026	.046	-0.001	.044	11.423*	5.585
TELL: Teacher Leadership	-0.169	.093	-0.09	.091	-0.007	.087	5.461	11.747
TELL: School Leadership	0.213*	.100	0.131	.097	0.113	.092	-32.756*	15.450
TELL: Professional Development	-0.117	.074	-0.065	.073	-0.143*	.071	7.723	11.489
TELL: Instructional Practices & Support	-0.02	.102	-0.012	.099	0.066	.095	26.908	14.658
Percent Free and Reduced Lunch			-0.078	.061	-0.028	.060	-18.011*	8.701
Percent Minority Students			-0.174**	.045	-0.180**	.065	-5.784	10.260
Percent Male Students			0.083	.120	0.088	.114	-34.496	17.567
Percent Minority Teachers					0.203	.177	99.168**	36.830
Percent Male Teachers					-0.014	.078	17.524	11.178
Average Years of Teaching Experience					0.013**	.003	-0.003**	.000
R <sup>2</sup>	0.134		0.225		0.319		0.489	
F for change in R <sup>2</sup>	3.656**		7.280**		8.420**		32.548**	

\*p<.05 \*\*p<.01

TABLE E-8. MODEL SUMMARY EXPLAINING HIGH SCHOOL TEACHER RETENTION BY TEACHING CONDITIONS CONSTRUCTS (N=170)

Variable	Model 1		Model 2		Model 3		Model 4	
	B	SE B	B	SE B	B	SE B	B	SE (B)
Intercept	0.518**	.162	-0.29	.305	0.412	.308	-81.876**	31.174
TELL: Time	-0.118*	.050	0.014	.050	-0.075	.044	-0.339	2.105
TELL: Community Support & Involvement	-0.026	.059	-0.095	.056	-0.121*	.048	7.493**	2.543
TELL: Facilities & Resources	0.149*	.064	0.140*	.057	0.088	.048	1.982	2.303
TELL: Managing Student Conduct	0.006	.042	0.019	.038	0.011	.032	4.020*	1.901
TELL: Teacher Leadership	-0.028	.086	-0.001	.077	0.068	.066	-4.617	3.649
TELL: School Leadership	0.065	.104	-0.032	.094	-0.064	.081	3.563	4.207
TELL: Professional Development	-0.043	.072	0.05	.069	0.026	.059	-8.141**	3.105
TELL: Instructional Practices & Support	0.071	.104	-0.053	.095	0.085	.083	9.565*	4.155
Attendance Rate			1.204**	.262	0.469	.256	93.743**	30.608
Percent Free and Reduced Lunch			0.021	.059	0.018	.051	-3.74	2.681
Percent Minority Students			-0.09	.056	0.115	.060	-1.695	2.817
Percent Male Students			-0.307*	.118	-0.514**	.102	-5.057	8.608
Percent Minority Teachers					-0.635**	.151	-9.136	8.141
Percent Male Teachers					0.155*	.062	-2.167	3.024
Average Years of Teaching Experience					0.010**	.003	0.000**	.000
Percent First Year Teachers					-0.577**	.133	-0.220*	.094
R <sup>2</sup>	0.077		0.285		0.514		0.185	
F for change in R <sup>2</sup>	1.679		11.418**		18.023**		6.160*	

\*p<.05 \*\*p<.01

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## 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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110 Cooper Street, Suite 500, Santa Cruz, CA 95060  
831-600-2200 | Fax: 831-427-9017 | [info@newteachercenter.org](mailto:info@newteachercenter.org)  
[www.newteachercenter.org](http://www.newteachercenter.org)

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