TELL Kentucky Student Achievement and Teacher Retention Analyses

Introduction

With the leadership and guidance of the Kentucky Department of Education (KDE), a coalition of partners[1] worked collaboratively with the New Teacher Center (NTC) to administer the second iteration of the Kentucky Teaching, Empowering, Leading and Learning Survey (TELL Kentucky Survey) to assess 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. The TELL Survey is designed to report educators' perceptions about the presence of teaching and learning conditions, including: Time, Facilities and Resources, Professional Development, School Leadership, Teacher Leadership, Instructional Practices and Support, Managing Student Conduct, and Community Support and Involvement.

A series of NTC briefs provide results from the 2013 TELL Kentucky Survey. Briefs summarizing the instrument design and psychometric properties, and describing preliminary findings and group comparisons, can be found on the TELL Kentucky website under the Research tab (www.tellkentucky.org/research).

This brief establishes the research foundation that specifically links teaching conditions, as measured by the NTC survey, to student achievement and teacher retention outcomes; provides information on response rate to the 2013 TELL Kentucky Survey; provides school-level descriptive information; and tests the association between 2013 survey data and student and teacher outcomes. The purpose of this report is to help stakeholders better understand the relationship between teaching conditions and outcomes of interest within the state context.

Providing Teachers With the Best Opportunity to Be Effective

The current policy context, with an increased emphasis on teacher and principal evaluation, demands a more nuanced understanding of the association between teaching and student learning. Stakeholders want to better understand which conditions help teachers best contribute 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 high-level research is summarized below to provide a context for the TELL Kentucky Survey analyses that follow.

1. The coalition of education stakeholders included Governor Beshear, Commissioner Holliday, the Kentucky Department of Education, the Kentucky Association of School Superintendents, the Kentucky School Boards Association, the Kentucky Association of School Administrators, the Kentucky Education Association, The Education Professional Standards Board, the Kentucky Chamber, the Kentucky Association of School Councils, the Kentucky Council on Postsecondary Education, TELL Kentucky and the Kentucky PTA.

Connections Between Teaching Conditions and Student Learning

Teachers' success with students is facilitated by a positive school context, which typically includes factors such as support from leadership and a collaborative working environment (Johnson, 2006). In particular, the presence of strong, trusting relationships for teachers—with both colleagues and the community (Bryk & Schneider, 2002)—and supportive school leadership are linked to improved student achievement. Other research demonstrates the importance of communication and collaboration for improving student achievement. In schools where teachers talked to each other about their work and principals communicated with the community, students had higher reading and mathematics test scores than in schools where the conditions were not as strong. In fact, these conditions had a greater impact on test scores than the experience or credentials of the staff (Leana & Pil, 2006). Recent research describes how the specific areas assessed by the TELL Kentucky Survey are theoretically and empirically linked to important outcomes, including student learning.

In a forthcoming book featuring research from the Bill & Melinda Gates Foundation's Measures of Effective Teaching Project, 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 significant predictors of student learning gains and student perceptions of rigor and support.

Recent work by Kraft and Papay (2014) uses student-teacher linked data and school-level teaching conditions as measured by the NTC survey to 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. The researchers controlled for student characteristics, prior test scores, and teacher and school characteristics. Teachers in schools in the 75th percentile in teaching conditions (as measured by 24 questions in NTC's TELL survey) were 38 percent more effective after a decade than those in the 25th percentile. Over two years, teachers were 11 percent more effective if they worked in schools with positive teaching conditions.

Using NTC survey data, Johnson, Kraft and Papay (2011) find that positive conditions contribute to improved student achievement. Specifically, their work shows that in low-income, high-minority schools, better-perceived teaching conditions are associated with better student academic outcomes.

Analyses using NTC survey data show that teaching conditions predict student achievement. Specifically, teaching conditions predict as much as 15 percent of school aggregate achievement results (Ladd, 2009).

Research using the TELL Kentucky Survey further supports these connections between school supports and teacher effectiveness and student learning. Analyses of the 2011 TELL Kentucky Survey data demonstrate that teaching conditions—specifically, Community Support and Involvement—were statistically significantly associated with student performance on Kentucky state assessments after controlling for school, teacher and student background characteristics. Time and Managing Student Conduct were also strong and significant predictors of school-level performance for elementary schools.

Connections Between Teaching Conditions and Teacher Retention

Large-scale empirical studies present evidence that contextual factors matter for teachers' decisions about staying and leaving schools. In a meta-analysis of 34 studies, researchers suggest that teaching and learning conditions influence teachers' career paths more than previously documented (Borman & Dowling, 2008). 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 (Pogodzinski et al., 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).

External researchers using NTC survey data with survey areas similar to the TELL Kentucky Survey also demonstrate associations between teaching conditions and teacher retention. Johnson, Kraft and Papay (2012) 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 traditional 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 percent of students categorized as low-income. Ladd (2009), also using TELL survey data, documents that teaching and learning conditions predict plans to leave a school, independent of school demographics.

Analyses by NTC using the TELL Kentucky Survey data indicate an association between teaching conditions and teachers choosing to stay in current schools. Specifically, teachers who want to remain working in their school are far more positive about aspects of School Leadership at the elementary and high school levels than those who indicate that they would like to move to another school or leave teaching altogether. At the middle school level, Community Support and Involvement, Time and Managing Student Conduct were associated with plans to remain in the classroom, after controlling for background factors.

To review these analyses, see the TELL Kentucky Survey website under the Historical tab (www.tellkentucky.org/historical).

The research summarized above shows that there is a well-established and consistent link between teaching conditions and both student achievement and teacher retention outcomes. The remainder of this brief adds to this research foundation through analysis of the 2013 TELL Kentucky Survey data. The following sections summarize survey participant responses and analyses at the state level and the school level to help stakeholders understand which teaching conditions matter most in promoting teacher and student success.

2013 TELL Kentucky Survey Participants

NTC administered the 2013 TELL Kentucky Survey to all school-based licensed educators in early 2013. The data for these analyses come from more than 43,761 educators in Kentucky, yielding a response rate of 87 percent. Respondents in 2013 include several categories of educators: 88 percent are teachers, more than 2 percent are principals, 2 percent are assistant principals, and 7 percent are other education professionals such as librarians and school psychologists (Table 1).

TABLE 1. RESPONSE RATE BY PARTICIPANT TYPE

Respondents*	2013 Response Rate (N)
Teachers	88.3 (38,621)
Principals	2.5 (1,091)
Assistant Principals	2 (895)
Other Education Professionals	7.1 (3,086)
Total**	43,761

***Note.** The respondent category "teachers" includes instructional coaches, department heads, literacy specialists, etc. The respondent category "Other Education Professionals" includes school counselors, school psychologists, social workers, etc.
**Less than one percent (68) of respondents did not include a defined position and are excluded from the analysis.

Response rates also vary by school type. As Table 2 demonstrates, the 2013 sample participating in the survey includes 90 percent of elementary school educators, 86 percent of middle school educators and 83 percent of high school educators.

TABLE 2. SURVEY RESPONSE RATE BY SCHOOL TYPE

School Level	2013		
	Responded	Headcount	Percent Responded
Elementary	22,880	25,407	90.1
Middle	8,189	9,548	85.8
High	11,408	13,826	82.5
Total	43,761	50,500	86.7

Of the 1,441 schools across the state of Kentucky, 1,296 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. Those results can be accessed at www.tellkentucky.org.

How Kentucky Teaching Conditions Impact Student Learning

The goal of the 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 better teacher retention?

A brief summary of outcomes and approaches follows, with a detailed methodology in Appendix A. The Kentucky Performance Rating for Educational Progress test (K-PREP) (http://education.ky.gov/AA/distsupp/Pages/K-PREP.aspx) measures student performance in terms of absolute achievement. In addition, a second student performance measure is a growth indicator that assesses academic progress using Kentucky's Student Growth Percentile, which compares a student's score to the student's academic peers using two years of test scores. Teacher retention is measured by the percent of teachers who indicate on the TELL Kentucky Survey that they intend to remain teaching in the school. It is an estimated teacher retention variable. The teaching conditions measures include an overall indicator that combines all eight constructs, as well as separate measures of each area. Other variables were provided by the Kentucky Department of Education. 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, as well as presenting results for the individual school levels. See Appendix A for a full explanation of statistical modeling and variables.

Teaching Conditions and Student Performance Analyses

In schools where educators report better teaching conditions, higher percentages of students achieve proficiency on the K-PREP. Specifically, two conditions consistently predict student achievement: Schools with strong student management systems and strong community support have more students achieve proficiency on the K-PREP.

These results are important because they show the impact of teaching conditions while controlling for factors such as student poverty, school size and teacher experience at the overall state level. Significantly, the contribution of teaching conditions to student achievement is stronger than the contribution of the percent of students categorized as receiving free or reduced-price lunch, the size of the school and the years of teaching experience. See Appendix B for state-level model statistics.

At all school levels—elementary, middle and high schools—schools are more likely to have more students rated proficient on the K-PREP if they have better teaching conditions. The contribution of teaching conditions to student learning is greater than the contribution of the years of teacher experience for elementary and middle schools.

Analyses for each school level that include the individual teaching conditions show that different factors matter at different school levels. At the elementary and middle school levels, Community Involvement and Support, as well as Managing Student Conduct, have significant and positive associations with student learning after controlling for other student, teacher and school factors. Additionally, Time, Instructional Practices and Support, and Professional Development are also significant at the elementary school level. At the high school level, Time demonstrated a significant and positive association with student achievement. Again, the contribution of teaching conditions is similar to the contribution of the number of years of teacher experience across these levels.

In schools where educators report better teaching conditions, students show more academic growth and the impact of teaching conditions is stronger than other teacher and student factors. In particular, schools with more positive student behavior systems demonstrate more academic growth than other schools.

Again, this approach controls for other factors and isolates 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. At the state level, the impact of teaching conditions on academic growth is stronger than the years of experience of teachers, the number of National Board Certified teachers, and the percent of students classified as receiving free or reduced-price lunches. See Appendix C 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 at the elementary and middle school levels. At these levels, the contribution of teaching conditions is stronger than that of the percent of students classified as receiving free or reduced-price lunches. In the high school model, teaching conditions overall did not impact student growth.

When testing the association between each teaching condition and student growth at each school level, analyses indicate that across levels, Managing Student Conduct consistently impacts student academic growth, except at the high school level. Increases in perceived positive student behavior management correspond to increases in academic growth.

Teaching Conditions and Teacher Retention Analyses

Consistent with student performance indicators, higher perceived teaching conditions are related to fewer teachers leaving their schools. Additionally, when considering individual teaching conditions, schools with positive student behavior systems retain more teachers compared to other schools.

These findings hold after including the contributions of other factors such as student and teacher background characteristics. This suggests that in schools where teachers report more positive conditions, fewer teachers choose to leave the classroom. Additionally, at the overall state level, the contribution of teaching conditions to teacher retention is the strongest predictor—more than three times stronger than the percent of students classified as low-income and two times stronger than years of teacher experience. See Appendix D for full models.

When testing the association between the mean composite teaching conditions measure and teacher retention at the different school levels, results indicate a consistent relationship at all school levels. Teacher retention is higher in schools where teachers perceive there are better teaching conditions compared to similar schools where teachers perceive there are less positive teaching conditions. Also, the influence of teaching conditions is consistently one of the strongest factors across school levels.

Models that examine individual teaching condition factors at each school level show that while different conditions matter at different school levels, conditions do matter at all levels. In elementary schools, teachers are more likely to stay at schools where they perceive more opportunity to participate in decision-making and strong student behavior systems. The contribution of these teaching conditions is stronger than the impact of years of teacher experience on decisions to stay. At the middle school level, professional development contributes to teachers' decisions to remain in a school. At the high school level, strong student behavior systems and strong community support are associated with decisions to stay or leave. At the high school level, these factors are more influential on decisions to stay than years of experience.

Summary

These analyses show that across important outcomes such as student performance, student academic growth and teacher retention, better teaching conditions are consistently associated with better outcomes. Across school levels, schools with better teaching conditions are likely to have better overall student achievement, more academic growth and higher teacher retention compared to similar schools with lower perceived teaching conditions. Additionally, the effect of teaching conditions is often greater than the effect of teacher experience on these outcomes.

Considering which teaching conditions most strongly impact learning at the overall state level, schools where educators perceive that there are positive student behavior management systems consistently demonstrate higher student performance, more academic growth and higher retention than similar schools. This finding is true across most school levels. Additionally, strong community support is related to student achievement and growth at the overall state level, achievement at the middle and elementary school levels, and retention at the high school level.

Implications

Together, these analyses build a compelling argument for how many factors within the control of stakeholders and policymakers contribute to creating environments where strong teaching and learning can occur. These findings suggest that student behavior management systems and community involvement play a key role across the outcomes of student learning, student academic gains and teacher retention across school levels. Stakeholders may consider additional analyses to better understand the intersection between these conditions and outcomes of interest, especially at the middle and high school levels where positive student management systems and strong community involvement are less typical than in elementary schools.

This evidence suggests that 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 campus-level reports. This data can facilitate conversations about how to maintain and improve the teaching conditions that analyses show help teachers and student succeed.

ACROSS SCHOOL LEVELS, ***schools with better teaching conditions are likely to have better overall student achievement, more academic growth and higher teacher retention compared to similar schools with lower perceived teaching conditions.***

Appendix A. 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 that 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; 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. Given the use of school-level data, OLS is an appropriate approach. The following equation (1) specifies the regression model using percent proficient on the K-PREP as the outcome variable:

(1) $Yi = \beta0 + \beta1(Student) + \beta2(School) + \beta3(Teacher) + \beta4(Teaching\ Conditions) + \beta i$

All variables are at the school level. The outcome variable Yi in model (1) is the percent of students scoring proficient or above on the K-PREP. The β0 represents the value of the outcome variable when all the independent variables are at zero. The independent variables are represented by β1- 4 and include blocks of characteristics about students, schools, teachers and teaching conditions. Variables included in each block follow and full descriptions are provided below.

- 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 an advanced degree, etc.
- School-level predictors: Student-to-teacher ratio, enrollment, etc.

The teaching conditions measure averages the eight construct means together for each school. The β, or betas, are values, one for each explanatory variable, that represent the strength and type of relationship the independent variable has to the dependent variable. If the β is positive, then as the independent variable increases, the outcome variable increases. If the β is negative, as the independent variable increases, the outcome variable decreases. The βi 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 Yi.

(2) $Yi = \beta0 + \beta1(Student) + \beta2(School) + \beta3(Teacher) + \beta4(Teaching\ Conditions) + \beta i$

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 Yi.

(3) $Yi = \beta0 + \beta1(Student) + \beta2(School) + \beta3(Teacher) + \beta4(Teaching\ Conditions) + \beta i$

Outcome Variables

Student performance is measured using the percent of the number of students accountable 100 days enrolled, which can be categorized as Proficient and Distinguished. 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)].

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 from grade levels 4-8 and 11 on the subjects of reading and mathematics. Students must be enrolled a full academic year (100 days) to be considered.

Calculated Teacher Retention is the rate at which teachers responding to the TELL Kentucky Survey responded that they intend to remain teaching in their school. The question

used to calculate this estimated teacher retention variable is 10.6 on the TELL Kentucky Survey.

Independent Variables Considered in the Models[2]

School Characteristics

- Parents on Council: Number of Parents/Guardians Serving on the School Council (SBDM) or its Committees as reported by the school.
- Full-time Equivalent Teachers: Full-time equivalent (FTE) data (not including administrators, guidance counselors or media specialists).
- 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.
- School Enrollment: Total count of students enrolled at a given facility.

Teacher Characteristics

- Percentage of Teachers with a Higher Degree: Percentages of teachers per school with degrees, including degrees of Bachelor's, Master's, Rank 1, Specialist, Doctorate and Total of all combined.
- Percent Minority Educators: The Percent Minority Educator is generated by adding all race/ethnicity categories other than white as defined by the KDE and dividing by the total number of educators. This percentage includes all educators identified as American Indian or Alaskan native, Asian or Pacific Islander, Black (not Hispanic), and Hispanic.
- 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: This is the rate at which teachers responding to the TELL Kentucky Survey responded that they intend to remain teaching in their school. The question used to calculate this estimated teacher retention variable is 10.6 on the TELL Kentucky Survey.
- 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.

Student Characteristics

- Percent Minority Students: The Percent Minority Students is generated by adding all race/ethnicity categories other than white as defined by the KDE and dividing by the total number of students. This percentage includes all students identified as American Indian or Alaskan native, Asian or Pacific Islander, Black (not Hispanic), and Hispanic.
- Limited English Proficient: This designation encompasses all students identified as either non-English proficient or limited English proficient. Non-English proficient is defined as a student who speaks a language other than English and does not comprehend, speak, read or write English. Limited English proficient is defined as a student who comprehends, speaks, reads or writes some English, but whose predominant comprehension or speech is in a language other than English. Districts must provide language services to all limited English proficient students.
- 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 2005, this amount was $35,798 for a family of four). Families with income up to 130 percent of the federal poverty level qualify for the free lunch program (in 2005, this amount was $25,155 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.

2. Data definitions can be found on Kentucky Department of Education website: http://applications.education.ky.gov/src/Glossary.aspx

Appendix B. Student Achievement

Statewide: Table B-1 presents statewide information from the OLS model (1) where the outcome variable is the percent proficient on the K-PREP; 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 indicates that for every one-point change in the teaching conditions mean, the percentage of students rated proficient on the K-PREP would increase almost 5 percentage points. Changes in the teaching conditions composite mean of half a point or less are more common; however, to make model interpretation easier, the standard one-point change in the mean is used. Table B-1 presents other factors the model identified as significant at the .05 level.

TABLE B-1. MODEL SUMMARY EXPLAINING STATEWIDE STUDENT ACHIEVEMENT (N=1,038)

Coefficients

Variable	*Unstandardized Coefficients*		*Standardized Coefficients*	*t*	*Sig. (P)*
	B	*Std. Error*	*Beta*		
(Constant)	-138.530	8.756		-15.821	.000
Teaching Conditions Composite Mean	4.597	.548	.213	8.381	.000
Attendance Rate	1.512	.090	.451	16.746	.000
Percent Free and Reduced Lunch	-2.951	.739	-.114	-3.992	.000
Average Years of Teaching Experience	.323	.044	.176	7.269	.000
Average Daily Membership	-.003	.001	-.120	-4.647	.000
Number of Parents on School Council	.021	.010	.053	2.192	.029

Adjusted R^2=.419

School Level: Models for elementary, middle and high school levels testing the association between the percent of students passing the K-PREP and overall teaching conditions show positive and significant associations (see Tables B-2 and B-3). See Table B-4 for model results displaying significant coefficients.

TABLE B-2. MODEL SUMMARY EXPLAINING ELEMENTARY SCHOOL STUDENT ACHIEVEMENT COMPOSITE (N=690)

Coefficients

Variable	*Unstandardized Coefficients*		*Standardized Coefficients*	*t*	*Sig. (P)*
	B	*Std. Error*	*Beta*		
(Constant)	14.755	1.733		8.514	.000
Teaching Conditions Composite Mean	3.643	.493	.213	7.389	.000
Percent Free and Reduced Lunch	-10.825	.574	-.552	-18.873	.000
Average Years of Teaching Experience	.182	.039	.130	4.609	.000
Number of Parents on School Council	.019	.008	.067	2.378	.018

Adjusted R^2=.466

TABLE B-3. MODEL SUMMARY EXPLAINING MIDDLE SCHOOL STUDENT ACHIEVEMENT COMPOSITE (N=212)

Coefficients

Variable	*Unstandardized Coefficients*		*Standardized Coefficients*	*t*	*Sig. (P)*
	B	*Std. Error*	*Beta*		
(Constant)	-17.464	13.531		-1.291	.198
Teaching Conditions Composite Mean	3.881	.665	.269	5.837	.000
Attendance Rate	.294	.139	.120	2.124	.035
Percent Free and Reduced Lunch	-8.868	1.025	-.504	-8.653	.000
Average Years of Teaching Experience	.228	.053	.198	4.335	.000

Adjusted R^2=.589

TABLE B-4. MODEL SUMMARY EXPLAINING HIGH SCHOOL STUDENT ACHIEVEMENT COMPOSITE (N=208)

Coefficients

Variable	*Unstandardized Coefficients*		*Standardized Coefficients*	*t*	*Sig. (P)*
	B	*Std. Error*	*Beta*		
(Constant)	-27.244	7.682		-3.546	.000
Teaching Conditions Composite Mean	1.443	.602	.126	2.398	.017
Attendance Rate	.382	.081	.295	4.686	.000
Percent Free and Reduced Lunch	-5.245	.784	-.412	-6.688	.000
Average Years of Teaching Experience	.191	.053	.183	3.597	.000

Adjusted R^2=.470

School Level by TELL Construct: Models for each school level that include the individual teaching conditions show that at the elementary school level, Time, Community Involvement and Support, Managing Student Conduct, and Instructional Practices and Support have significant and consistently positive association with student learning. However, these models also suggest that other conditions, such as Professional Development, have a negative relationship with the percent of students reaching proficiency on the K-PREP at the elementary level. In other words, in similar elementary schools, as educators perceive professional development to be more positive, fewer students are rated proficient on the K-PREP. One explanation may 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.

At the middle school level, Community Involvement and Support, as well as Managing Student Conduct, have significant and consistently positive association with student learning. At the high school level, Time is associated with student achievement. For complete models, see Tables B-5, B-6 and B-7.

TABLE B-5. MODEL SUMMARY EXPLAINING ELEMENTARY SCHOOL STUDENT ACHIEVEMENT (N=694)

Coefficients

Variable	*Unstandardized Coefficients*		*Standardized Coefficients*	*t*	*Sig. (P)*
	B	*Std. Error*	*Beta*		
(Constant)	10.372	2.041		5.082	.000
TELL: Time	1.414	.564	.103	2.509	.012
TELL: Community Support and Involvement	4.118	.723	.294	5.697	.000
TELL: Managing Student Conduct	1.011	.512	.081	1.973	.049
TELL: Professional Development	-4.501	.771	-.285	-5.836	.000
TELL: Instructional Practices and Support	2.427	1.173	.121	2.068	.039
Percent Free and Reduced Lunch	-7.817	.706	-.398	-11.078	.000
Average Years of Teaching Experience	.152	.038	.109	3.947	.000

Adjusted R^2=.513

TABLE B-6. MODEL SUMMARY EXPLAINING MIDDLE SCHOOL STUDENT ACHIEVEMENT (N=212)

Coefficients

Variable	*Unstandardized Coefficients*		*Standardized Coefficients*	*t*	*Sig. (P)*
	B	*Std. Error*	*Beta*		
(Constant)	8.690	2.621		3.316	.001
TELL: Community Support and Involvement	3.426	.977	.284	3.506	.001
TELL: Managing Student Conduct	1.530	.618	.161	2.477	.014
TELL: Instructional Practices and Support	-.440	1.108	-.026	-.397	.692
Percent Free and Reduced Lunch	-8.189	.947	-.465	-8.645	.000
Average Years of Teaching Experience	.192	.050	.167	3.818	.000

Adjusted R^2=.628

TABLE B-7. MODEL SUMMARY EXPLAINING HIGH SCHOOL STUDENT ACHIEVEMENT (N=208)

Coefficients

Variable	*Unstandardized Coefficients*		*Standardized Coefficients*	*t*	*Sig. (P)*
	B	*Std. Error*	*Beta*		
(Constant)	-58.844	6.790		-8.667	.000
TELL: Time	1.022	.515	.112	1.985	.048
Attendance Rate	.707	.073	.547	9.679	.000
Average Years of Teaching Experience	.177	.059	.170	3.023	.003

Adjusted R^2=.353

Appendix C. Student Growth Indicator

Statewide: Table C-1 shows statewide results from OLS model (2). The unstandardized coefficient for the teaching conditions composite mean indicates that every one-point change in the teaching conditions mean predicts a four-point increase in the median growth percentile score. It should be noted that a one-point change in the composite mean for perceived teaching conditions would be considered unusual. Smaller changes of half a point or less are more common. The table also presents other factors the model identified as significant.

TABLE C-1. MODEL SUMMARY EXPLAINING STATEWIDE STUDENT GROWTH PERFORMANCE (N=1,034)

Coefficients

Variable	*Unstandardized Coefficients*		*Standardized Coefficients*	*t*	*Sig. (P)*
	B	*Std. Error*	*Beta*		
(Constant)	-180.043	11.223		-16.043	.000
Teaching Conditions Composite Mean	4.208	.701	.164	6.005	.000
Attendance Rate	1.942	.116	.489	16.769	.000
Percent Free and Reduced Lunch	5.464	.957	.178	5.709	.000
Number of National Board Certified Teachers	.239	.073	.092	3.264	.001
Average Years of Teaching Experience	.218	.057	.100	3.841	.000
Average Daily Membership	-.006	.001	-.192	-6.687	.000

Adjusted R^2=.332

School Level: Individual models for each school level testing the relationship between student growth and overall perceived teaching conditions show that the composite teaching conditions measure is significant at the elementary and middle school levels but not at the high school level. See Tables C-2, C-3 and C-4 for models at each school level.

TABLE C-2. MODEL SUMMARY EXPLAINING ELEMENTARY SCHOOL STUDENT GROWTH PERFORMANCE (N=685)

Coefficients

Variable	*Unstandardized Coefficients*		*Standardized Coefficients*	*t*	*Sig. (P)*
	B	*Std. Error*	*Beta*		
(Constant)	-11.573	11.927		-.970	.332
Teaching Conditions Composite Mean	1.935	.576	.121	3.360	.001
Attendance Rate	.346	.121	.119	2.847	.005
Percent Free and Reduced Lunch	-5.186	.773	-.285	-6.706	.000
Adjusted R^2=.166					

TABLE C-3. MODEL SUMMARY EXPLAINING MIDDLE SCHOOL STUDENT GROWTH PERFORMANCE (N=212)

Coefficients

Variable	*Unstandardized Coefficients*		*Standardized Coefficients*	*t*	*Sig. (P)*
	B	*Std. Error*	*Beta*		
(Constant)	9.209	9.463		-1.398	.164
Teaching Conditions Composite Mean	2.479	.659	.046	.583	.561
Percent Free and Reduced Lunch	-2.420	.099	.250	2.618	.010
Average Years of Teaching Experience	.124	1.005	-.293	-3.042	.003
Adjusted R^2=.152					

TABLE C-4. MODEL SUMMARY EXPLAINING HIGH SCHOOL STUDENT GROWTH PERFORMANCE (N=144)

Coefficients

Variable	*Unstandardized Coefficients*		*Standardized Coefficients*	*t*	*Sig. (P)*
	B	*Std. Error*	*Beta*		
(Constant)	-13.227	9.463		-1.398	.164
Teaching Conditions Composite Mean	.384	.659	.046	.583	.561
Attendance Rate	.259	.099	.250	2.618	.010
Percent Free and Reduced Lunch	-3.057	1.005	-.293	-3.042	.003
Adjusted R^2=.219					

School Level by TELL Construct: When testing the association between each teaching conditions and student growth at each school level, and specific to individual areas assessed by the TELL Kentucky Survey, models indicate that at the elementary school level, Managing Student Conduct and Community Involvement and Support are related to student academic growth. At the middle school level, Managing Student Conduct and Professional Development are positively related to the student growth indicator. At the high school level, Professional Development is negatively associated with the student growth indicator. See Tables C-5, C-6 and C-7 for school-level models showing significant teaching factors.

TABLE C-5. MODEL SUMMARY EXPLAINING ELEMENTARY SCHOOL STUDENT GROWTH PERFORMANCE (N=685)

Coefficients

Variable	*Unstandardized Coefficients*		*Standardized Coefficients*	*t*	*Sig. (P)*
	B	*Std. Error*	*Beta*		
(Constant)	-12.967	11.912		-1.089	.277
TELL: Managing Student Conduct	1.189	.583	.102	2.039	.042
Attendance Rate	.341	.121	.117	2.824	.005
Percent Free and Reduced Lunch	-4.318	.871	-.238	-4.959	.000
Adjusted R^2=.175					

TABLE C-6. MODEL SUMMARY EXPLAINING MIDDLE SCHOOL STUDENT GROWTH PERFORMANCE (N=212)

Coefficients

Variable	*Unstandardized Coefficients*		*Standardized Coefficients*	*t*	*Sig. (P)*
	B	*Std. Error*	*Beta*		
(Constant)	10.487	2.054		5.106	.000
TELL: Managing Student Conduct	2.773	.512	.415	5.414	.000
Average Years of Teaching Experience	.133	.052	.165	2.581	.011
Adjusted R^2=.160					

TABLE C-7. MODEL SUMMARY EXPLAINING HIGH SCHOOL STUDENT GROWTH PERFORMANCE (N=208)

Coefficients

Variable	*Unstandardized Coefficients*		*Standardized Coefficients*	*t*	*Sig. (P)*
	B	*Std. Error*	*Beta*		
(Constant)	-29.862	5.671		-5.265	.000
Attendance Rate	.468	.059	.484	7.994	.000
Adjusted R^2=.242					

Appendix D. Teacher Retention

Statewide: Table D-1 presents statewide results from OLS model (3). The model demonstrates that as teachers view their school's teaching conditions more positively, the teacher retention rate increases. Table D-1 also presents other factors the model identified as significant.

TABLE D-1. MODEL SUMMARY EXPLAINING STATEWIDE TEACHER RETENTION (N=1,118)

Coefficients

Variable	*Unstandardized Coefficients*		*Standardized Coefficients*	*t*	*Sig. (P)*
	B	*Std. Error*	*Beta*		
(Constant)	-.240	.205		-1.172	.242
Teaching Conditions Composite Mean	.186	.014	.374	13.661	.000
Attendance Rate	.005	.002	.069	2.361	.018
Percent Free and Reduced Lunch	-.064	.017	-.112	-3.858	.000
Average Years of Teaching Experience	.007	.001	.168	6.312	.000

Adjusted R^2=.235

School Level: Teacher retention is higher at all school levels when teachers perceive that there are better teaching conditions. Tables D-2, D-3 and D-4 present significant coefficients.

TABLE D-2. MODEL SUMMARY EXPLAINING ELEMENTARY SCHOOL RETENTION COMPOSITE (N=690)

Coefficients

Variable	*Unstandardized Coefficients*		*Standardized Coefficients*	*t*	*Sig. (P)*
	B	*Std. Error*	*Beta*		
(Constant)	1.117	.346		3.228	.001
Teaching Conditions Composite Mean	.168	.016	.361	10.429	.000
Attendance Rate	-.008	.003	-.089	-2.155	.032
Percent Free and Reduced Lunch	-.133	.022	-.249	-5.912	.000
Average Years of Teaching Experience	.003	.001	.084	2.410	.016
Adjusted R^2=.233					

TABLE D-3. MODEL SUMMARY EXPLAINING MIDDLE SCHOOL RETENTION COMPOSITE (N=214)

Coefficients

Variable	*Unstandardized Coefficients*		*Standardized Coefficients*	*t*	*Sig. (P)*
	B	*Std. Error*	*Beta*		
(Constant)	.051	.116		.444	.657
Teaching Conditions Composite Mean	.208	.037	.345	5.622	.000
Average Years of Teaching Experience	.013	.003	.288	4.698	.000
Adjusted R^2=.199					

TABLE D-4. MODEL SUMMARY EXPLAINING HIGH SCHOOL RETENTION COMPOSITE (N=229)

Coefficients

Variable	*Unstandardized Coefficients*		*Standardized Coefficients*	*t*	*Sig. (P)*
	B	*Std. Error*	*Beta*		
(Constant)	.112	.110		1.013	.312
Teaching Conditions Composite Mean	.221	.035	.386	6.328	.000
Adjusted R^2=.151					

School Level by TELL Construct: In elementary schools, the Managing Student Conduct and Teacher Leadership constructs are associated with more teachers staying in a school. Professional Development is negatively associated with teacher retention at the elementary school level. At the middle school level, Professional Development demonstrates a positive association with teacher retention. At the high school level, Managing Student Conduct and Community Involvement and Support are related to an increase in retention. See Tables D-5, D-6 and D-7 for full models.

TABLE D-5. MODEL SUMMARY EXPLAINING ELEMENTARY SCHOOL TEACHER RETENION (N=694)

Coefficients

Variable	*Unstandardized Coefficients*		*Standardized Coefficients*	*t*	*Sig. (P)*
	B	*Std. Error*	*Beta*		
(Constant)	1.121	.348		3.220	.001
TELL: Managing Student Conduct	.056	.017	.163	3.289	.001
TELL: Teacher Leadership	.113	.021	.300	5.274	.000
Attendance Rate	-.007	.004	-.082	-2.025	.043
Percent Free and Reduced Lunch	-.126	.023	-.231	-5.484	.000
Average Years of Teaching Experience	.003	.001	.088	2.568	.010

Adjusted R^2=.256

TABLE D-6. MODEL SUMMARY EXPLAINING MIDDLE SCHOOL TEACHER RETENTION (N=214)

Coefficients

Variable	*Unstandardized Coefficients*		*Standardized Coefficients*	*t*	*Sig. (P)*
	B	*Std. Error*	*Beta*		
(Constant)	.348	.123		2.824	.005
TELL: Professional Development	.110	.040	.179	2.757	.006
Average Years of Teaching Experience	.014	.003	.309	4.777	.000
Adjusted R^2=.118					

TABLE D-7. MODEL SUMMARY EXPLAINING HIGH SCHOOL TEACHER RETENTION (N=229)

Coefficients

Variable	*Unstandardized Coefficients*		*Standardized Coefficients*	*t*	*Sig. (P)*
	B	*Std. Error*	*Beta*		
(Constant)	.229	.097		2.373	.018
TELL: Community Support and Involvement	.119	.040	.240	2.992	.003
TELL: Managing Student Conduct	.070	.032	.177	2.210	.028
Adjusted R^2=.141					

References

American Educational Research Association, American Psychological Association and National Council on Measurement in Education. (1999). *Standards for educational and psychological testing.* Washington, D.C.: American Educational Research Association.

Bandalos, D. & Boehm-Kaufman, M. (2009). Four common misconceptions in exploratory factor analysis. In C. Lance & R. Vandenberg (Eds.), *Statistical and methodological myths and urban legends: Doctrine, verity and fable in the organizational and social sciences.* (pp. 61–87). U.K.:Taylor & Francis.

Borman, G. & Dowling, N. (2008). Teacher attrition and retention: A meta-analytic and narrative review of the research. *Review of Educational Research,* 78(3).

Boyd, D., Grossman, P., Ing, M., Lankford, H., Loeb, S. & Wyckoff, J. (2011). The influence of school administrators on teacher retention decisions. *American Educational Research Journal*, 48(2).

Buckley, J., Schneider, M., & Shang, Y. (2004). *The effects of school facility quality on teacher retention in urban school districts.* Chestnut Hill, MA: National Clearinghouse for Educational Facilities.

Bryk, A. S. & Schneider, B. (2002). *Trust in schools: A core resource for improvement*. New York: Russell Safe Foundation.

Cortina, J. (2002). Big things have small beginnings: An assortment of "minor" methodological misunderstandings. *Journal of Management*, 28(3).

Ferguson, R. & Hirsch, E. (2014). "Using teacher and student surveys to link school context, classroom learning conditions and achievement," in Kane, T.J., Kerr, K.A. & Pianta, R.C. *New guidance from the Measures of Effective Teaching project*. San Francisco: Jossey-Bass.

George, D. & Mallery, P. (2003). SPSS for Windows step by step: A simple guide and reference. 11.0 update (4th ed.). Boston, MA: Allyn & Bacon.

Hair, J., Black, W., Babin, B., Anderson, R. & Tatham, R. (2006). Multivariate data analysis (6th ed.). Upper Saddle River, NJ: Pearson Prentice Hall.

Hanushek, E. A. & Rivkin, S. G. (2007, Spring). Pay, working conditions, and teacher quality. *The Future of Children*, 17(1), 69-86. The Future of Children is a collaboration of The Woodrow Wilson School of Public and International Affairs at Princeton University and The Brookings Institution.

Johnson, S., Kraft, M. & Papay, J. (2011). How context matters in high-need schools: The effects of teachers' working conditions on their professional satisfaction and their students' achievement. *Teachers College Record*, 114(10).

Johnson, S. M. (2006, July). *The workplace matters: Teacher quality, retention, and effectiveness*. NEA Working Paper. Washington, D.C.: National Education Association.

Johnson, S. M. & The Project on the Next Generation of Teachers. (2004). *Finders and keepers: Helping new teachers survive and thrive in our schools*. San Francisco: Jossey-Bass.

Kraft, M.A. & Papay, J.P. (in press). Do supportive professional environments promote teacher development? Explaining heterogeneity in returns to teaching experience. *Educational Evaluation and Policy Analysis*.

Ladd, H. (2009). Teachers' perceptions of their working conditions: How predictive of policy relevant outcomes? CALDER Working Paper 33. Washington, D.C.: National Center for Analysis of Longitudinal Data in Education.

Ledesma, R., & Valero-Mora, P. (2007). Exploratory factor analysis. *Practical Assessment, Research & Evaluation*, 12(22).

Leana, C. & Pil, F. (2006)."Social Capital and Organizational Performance: Evidence from Urban Public Schools." *Organization Science*. Vol. 17, No. 3, May–June 2006, pp. 353-366.

Loeb, S., Darling-Hammond, L. & Luczak, J. (2005). How teaching conditions predict teacher turnover in California schools. *Peabody Journal of Education*, 80(3).

McLaughlin, M. W. & Talbert, J. E. (2001). *Professional communities and the work of high school teaching*. Chicago: University of Chicago Press.

Pogodzinski, B., Youngs, P., Frank, K. & Belman, D. (2012). Administrative climate and novices' intent to remain teaching. *The Elementary School Journal*, 113(2).

Steele, J., Hamilton, L. & Stecher, B. (2010). *Incorporating student performance measures into teacher evaluation systems*. Santa Monica, CA: RAND Corporation.

Swanlund, A. (2011). *Identifying working conditions that enhance teacher effectiveness: The psychometric evaluation of the Teacher Working Conditions Survey*. Chicago. IL: American Institutes for Research.

UCLA: Statistical Consulting Group. Factor Analysis: from www.ats.ucla.edu/stat/spss/output/factor1.htm *(accessed Nov. 20, 2012).*

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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