



Student Achievement and Teacher Attrition Analyses

Introduction

In spring 2014, with the leadership of Superintendent June St. Claire Atkinson, the North Carolina Department of Public Instruction (NCDPI) collaborated with the North Carolina Association of Educators and the New Teacher Center (NTC) to administer the seventh biennial North Carolina Teacher Working Conditions (NC TWC) Survey. The survey assesses whether educators across North Carolina report having the resources and supports necessary to ensure effective teaching.

The NC TWC Survey is a full-population survey based on the NTC Teaching, Empowering, Leading and Learning (TELL) Survey first developed in the North Carolina Governor's Office in 2002. It has since been replicated in more than 12 states and 10 districts to collect critical data to support school improvement efforts. Specifically, the survey is designed to report educators' perceptions about the presence 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.

A series of NTC briefs provide results from the 2014 NC TWC Survey describing preliminary findings

and group comparisons. These resources can be found on the North Carolina Teacher Working Conditions website under the Research tab (<http://www.ncteachingconditions.org/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 2014 NC TWC Survey, tests the association between 2014 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 North Carolina.

The current 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 under what conditions teachers 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 work is summarized below as background to the NC TWC 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, 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 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 NC TWC 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 2014 NC TWC 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.

2014 North Carolina TWC Survey Participants

NTC administered the 2014 NC TWC Survey to all school-based licensed educators in early 2014. The data for these analyses include responses from more than 93,000 educators in North Carolina, yielding a response rate of 88.6 percent. Respondents include several categories of educators: 89.3 percent are teachers, 1.6 percent are principals, 1.9 percent are assistant principals, and 7.2 percent are other licensed educators such as librarians and school psychologists (Table 1).

Respondents	Response Rate (N) Spring 2014
Teachers	89.3% (83,208)
Principals	1.6% (1,479)
Assistant Principal	1.9% (1,756)
Other Education Professional	7.2% (6,734)

Response rates also vary by school type. As Table 2 demonstrates, the sample of participants includes 91.7 percent of all elementary school educators, 85.3 percent of middle school educators, 87.4 percent of high school educators, 72.2 percent of educators at special schools.

School Type	Headcount	Responded	Percent Responded
Elementary	47,656	43,705	91.7
Middle	32,016	27,299	85.3
High	25,004	21,842	87.4
Special	460	332	72.2
Total	105,136	93,178	88.6

Of the 2,597 schools across the state of North Carolina, 2,470 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 <http://www.ncteachingconditions.org/results>.

How North Carolina 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 North Carolina schools. Do schools with better teaching conditions have better student performance, greater academic growth, and/or less teacher attrition?

A brief summary of outcomes and approaches follows, with a detailed methodology provided in Appendix A. The North Carolina End-of-Grade test in Math (EOG) is used here to measure student performance in terms of absolute achievement. Teacher attrition is based on data received from the North Carolina Department of Public Instruction (NCDPI). Definitions of these variables and how they are calculated can be found in Appendix A. The teaching conditions measures include both an overall indicator that combines all eight constructs as well as separate measures of each construct. The NCDPI provided other variables. All measures are reported at the state and 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. See Appendix A for a full discussion 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 EOG. Specifically, two conditions predict student achievement—at schools with strong or sufficient teacher leadership or policies managing student conduct, more students achieve proficiency on the EOG.

These results are important because they show the impact of teaching conditions while controlling for factors such as Average Daily Membership (ADM), teacher licensure, and student conduct at the overall state level. Significantly, the influence of student conduct management on student achievement is stronger than the contribution of the number of students attending the school. See Appendix B for state- and school-level model statistics.

School-level analyses testing the association between the percentage of students performing well on the EOG and overall teaching conditions suggest that at middle and high schools where educators report better teaching conditions, it is more likely that higher percentages of students perform better on the EOG; findings at the elementary level were not significant. The analyses also found that the contribution of teaching conditions to student learning is greater than the contribution of percent of educators with emergency provisional licenses and the age of books found in the school's library. See Appendix B.

School-level analyses that include individual teaching conditions show that different factors matter at different school levels. At the elementary and middle school levels, for example, the Managing Student Conduct construct has significant and positive associations with student learning

after controlling for other student, teacher, and school factors. In addition, elementary school analyses found that the contribution of Managing Student Conduct to student learning is greater than the contribution of teacher turnover and the number of students attending the school. Alternatively, at the elementary and middle school levels, Professional Development demonstrates a significant association with student achievement but in the negative direction, and this contribution is greater than the contribution of the percentage of criminal incidents in a school. For complete models, see Appendix B.

Teaching Conditions and Teacher Attrition Analyses

Overall, perceptions of more positive teaching conditions are related to lower teacher attrition, with fewer teachers leaving their schools. When considering individual teaching conditions, schools with strong or sufficient teacher leadership, student conduct management, and community support and involvement retain more teachers compared to schools with less positive perceptions about these conditions.

When testing the association between overall teaching conditions and teacher attrition at the different school levels, there are no significant relationships between the overall working condition composite measure and teacher attrition for any of the individual school-level analyses. However, models that examine the influence on teacher attrition of individual teaching conditions at each school level show that individual conditions matter at different school levels. For example, in elementary schools where teachers perceive strong teacher leadership and strategies for managing student conduct, they are more likely to stay. At the middle school level, teacher leadership contributes to teacher decisions to remain in a school, and the influence of these teaching conditions on decisions to stay is stronger than the impact of the school-level variable of percent of students receiving short-term, in-school suspensions. At the high school level, fewer teachers leave when there is more involvement and support from the local community. Appendix C presents tables associated with these findings.

Summary

These analyses show that better teaching conditions are consistently associated with better outcomes in terms of student performance and teacher retention. Specifically, teacher leadership, student conduct management, and community support and involvement are related to higher student achievement and lower teacher attrition in North Carolina schools.

Implications

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 student conduct management, teacher leadership, and community support and involvement 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 NC TWC district- and school-level reports. These data can facilitate conversations about how to maintain and improve the teaching conditions that analyses demonstrate help teachers and students succeed.

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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 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 on EOG as the outcome variable:

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

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

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

The teacher retention regression model (2) follows a similar equation as presented for the student outcome models. The rate of teachers leaving classrooms is the outcome variable Y_i .

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

Outcome Variables

Student Performance

North Carolina's state-developed, standardized End-of-Grade (EOG) and End-of-Course tests for grades 3–8, and 10, respectively, are given in the final three weeks of the school year and are linked to the state's Standard Course of Study for each grade level. These tests measure student learning in reading/language arts and mathematics.

Teacher Attrition

This variable is calculated at the state level looking at whether a teacher is still present at his/her same school year after year with the same job classification code.

Independent Variables Considered in the Models

School Characteristics

- Instructional Computers per Student
- Average Daily Membership (ADM)—Number of students enrolled on October 10 of current school year
- Books per Student
- Age of Books in School—Age of books in school library
- Percent Classroom Internet Connectivity—Percent of computers in the school that are connected to the Internet
- Percent Crime—Percent of reportable incidents at the school level
- Percent Short Term Suspensions

Teacher Characteristics

- Percent Fully Licensed Educators
- Percent Novice Teachers (Years 0–3)
- Percent National Board Certified Teachers
- Percent of Teachers with Advanced Degree
- Percent of Teachers Emergency Provisionally Licensed

- Percent of Lateral Entry Teachers

- Percent Highly Qualified (as determined by the NCDPI)

Student Characteristics

- Percent of Average Daily Attendance

- Percent of Students Qualifying for Free or Reduced Price Lunches

Appendix B. Student Achievement

Statewide Composite

Table B-1 presents information from the OLS model (1) where the outcome variable is the performance on the EOG, 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 1-point change in the teaching conditions mean, the percentage of students score on the EOG 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 1-point change in the mean is used. The table presents other factors the model identified as significant at the .05 level.

TABLE B-1. MODEL SUMMARY EXPLAINING STATEWIDE STUDENT ACHIEVEMENT MEAN COMPOSITE (N=2,227)					
Variable	Coefficients			t	Sig. (P)
	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta		
(Constant)	-71.627	9.516		-7.527	.000
Average Daily Membership	.002	.001	.046	1.750	.080
Age of Books in School	.206	.067	.052	3.090	.002
Books per Student	-.047	.022	.041	-2.168	.030
Percent Fully Licensed Teachers	16.740	6.058	.052	2.763	.006
Percent Novice Teachers (Years 0–3)	-5.388	2.817	-.034	-1.912	.056
Percent National Board Certified Teachers	.116	.070	.040	1.653	.098
Percent of Teachers with Advanced Degree	5.393	2.676	.037	2.015	.044
Percent of Teachers Emergency Provisionally Licensed	61.072	18.775	.058	3.253	.001
Percent of Students Qualifying for Free or Reduced Price Lunches	-29.676	1.258	-.455	-23.590	.000
Percent of Average Daily Attendance	135.763	7.235	.315	18.766	.000
Teaching Condition: Overall Composite	4.494	1.313	.060	3.424	.001
Adjusted R ² =.404					

Statewide by TELL Construct

Models at the state level that included the individual teaching conditions show that the Managing Student Conduct

and Teacher Leadership constructs have a significant and consistently positive association with student learning. Professional Development has a significant and negative association with student achievement. See Table B-2.

TABLE B-2. MODEL SUMMARY EXPLAINING STATEWIDE STUDENT ACHIEVEMENT CONSTRUCT AREA (N=2,227)

Coefficients					
Variable	Unstandardized Coefficients		Standardized Coefficients	t	Sig. (P)
	B	Std. Error	Beta		
(Constant)	-20.545	8.661		-2.372	.018
Average Daily Membership	.005	.001	.104	5.472	.000
Age of Books in School	.172	.065	.043	2.635	.008
Percent Short Term Suspensions	-.065	.009	-.136	-7.107	.000
Percent of Teachers Emergency Provisionally Licensed	47.949	17.224	.045	2.784	.005
Percent of Students Qualifying for Free or Reduced Price Lunches	-26.923	1.266	-.413	-21.259	.000
Percent of Average Daily Attendance	107.811	7.941	.250	13.576	.000
Teaching Condition: Managing Student Conduct	5.792	1.370	.114	4.226	.000
Teaching Condition: Teacher Leadership	6.089	1.839	.099	3.312	.001
Teaching Condition: Professional Development	-10.967	1.909	-.153	-5.744	.000
Adjusted R ² =.423					

School Level Composite

Models for middle and high schools testing the association between the percentage of students passing EOG and overall

teaching conditions show positive and significant associations (see Tables B-4–B-5). Elementary schools failed to show significant differences between the two variables (Table B-3).

TABLE B-3. MODEL SUMMARY EXPLAINING ELEMENTARY SCHOOL STUDENT ACHIEVEMENT COMPOSITE (N=1,289)

Variable	Unstandardized Coefficients		Standardized Coefficients	t	Sig. (P)
	B	Std. Error	Beta		
	(Constant)	-334.102	66.345		-5.036
Average Daily Membership	.002	.003	.019	.546	.585
Age of Books in School	.126	.121	.026	1.037	.300
Instructional Computers per Student	.264	.289	.023	.914	.361
Books per Student	.069	.037	.050	1.838	.066
Percent Classroom Internet Connectivity	-42.997	32.123	-.031	-1.339	.181
Percent Short-Term Suspensions	-.074	.049	-.041	-1.533	.125
Percent Crime	-.278	.879	-.008	-.316	.752
Percent Fully Licensed Teachers	10.571	29.760	.020	.355	.722
Percent Novice Teachers (Years 0–3)	-5.015	4.290	-.032	-1.169	.243
Percent National Board Certified Teachers	.031	.117	.008	.269	.788
Percent of Teachers with Advanced Degree	5.166	3.810	.035	1.356	.175
Teacher Attrition	-15.265	5.929	-.067	-2.575	.010
Percent of Teachers Emergency Provisionally Licensed	18.358	42.330	.014	.434	.665
Percent of Lateral Entry Teachers	-.408	34.422	-.001	-.012	.991
Percent of Highly Qualified Teachers	29.876	27.979	.026	1.068	.286
Percent of Students Qualifying for Free or Reduced Price Lunches	-24.335	1.979	-.373	-12.299	.000
Percent of Average Daily Attendance	431.702	54.049	.212	7.987	.000
Teaching Condition: Overall Composite	2.878	1.856	.037	1.551	.121

Adjusted R²=.327

TABLE B-4. MODEL SUMMARY EXPLAINING MIDDLE SCHOOL STUDENT ACHIEVEMENT COMPOSITE (N=563)

Coefficients					
Variable	Unstandardized Coefficients		Standardized Coefficients	t	Sig. (P)
	B	Std. Error	Beta		
(Constant)	-15.078	8.613		-1.751	.081
Books per Student	.094	.029	.093	3.172	.002
Percent Classroom Internet Connectivity	4.558	2.394	.063	1.905	.057
Percent Short-Term Suspensions	-.098	.016	-.225	-6.261	.000
Percent Crime	-1.153	.351	-.099	-3.286	.001
Percent National Board Certified Teachers	.329	.083	.126	3.942	.000
Percent of Teachers with Advanced Degree	11.530	3.308	.112	3.485	.001
Percent of Teachers Emergency Provisionally Licensed	38.956	23.166	.046	1.682	.093
Percent of Highly Qualified Teachers	38.798	9.315	.175	4.165	.000
Percent of Students Qualifying for Free or Reduced Price Lunches	-24.019	1.663	-.483	-14.446	.000
Percent of Average Daily Attendance	49.380	11.504	.176	4.292	.000
Teaching Condition: Overall Composite	3.939	1.628	.068	2.420	.016
Adjusted R ² = .626					

TABLE B-5. MODEL SUMMARY EXPLAINING HIGH SCHOOL STUDENT ACHIEVEMENT COMPOSITE (N=426)

Coefficients					
Variable	Unstandardized Coefficients		Standardized Coefficients	t	Sig. (P)
	B	Std. Error	Beta		
(Constant)	-48.151	11.384		-4.230	.000
Average Daily Membership	.005	.001	.150	4.253	.000
Age of Books in School	.264	.094	.085	2.806	.005
Percent Crime	-1.053	.240	-.137	-4.388	.000
Percent of Teachers Emergency Provisionally Licensed	102.555	27.427	.109	3.739	.000
Percent of Students Qualifying for Free or Reduced Price Lunches	-30.679	2.454	-.405	-12.503	.000
Percent of Average Daily Attendance	114.838	7.224	.498	15.898	.000
Teaching Condition: Overall Composite	8.153	2.666	.098	3.058	.002
Adjusted R ² = .647					

School Level by TELL Construct

Models for each school level that included the individual teaching conditions show that, at the elementary and middle school levels, the Managing Student Conduct construct has a

significant and consistently positive association with student learning. Professional Development at the elementary and middle school levels has a significant and negative association with student achievement. For complete models, see Tables B-6–B-8.

TABLE B-6. MODEL SUMMARY EXPLAINING ELEMENTARY SCHOOL STUDENT ACHIEVEMENT CONSTRUCT AREA (N=1,289)

Variable	Coefficients			t	Sig. (P)
	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta		
(Constant)	-27.723	13.827		-2.005	.045
Teacher Attrition	-21.049	5.488	-.092	-3.835	.000
Percent of Students Qualifying for Free or Reduced Price Lunches	-27.311	1.678	-.415	-16.280	.000
Percent of Average Daily Attendance	122.452	13.583	.209	9.015	.000
Teaching Condition: Managing Student Conduct	7.114	2.145	.123	3.316	.001
Teaching Condition: Teacher Leadership	4.057	2.686	.065	1.510	.131
Teaching Condition: Professional Development	-10.248	2.843	-.138	-3.605	.000

Adjusted R²=.311

TABLE B-7. MODEL SUMMARY EXPLAINING MIDDLE SCHOOL STUDENT ACHIEVEMENT CONSTRUCT AREA (N=563)

Coefficients					
Variable	Unstandardized Coefficients		Standardized Coefficients	t	Sig. (P)
	B	Std. Error	Beta		
(Constant)	-1.601	8.490		-.189	.851
Books per Student	.067	.029	.067	2.323	.021
Percent Classroom Internet Connectivity	6.951	2.357	.097	2.949	.003
Percent Short-Term Suspensions	-.097	.016	-.222	-6.228	.000
Percent Crime	-.907	.349	-.078	-2.600	.010
Percent of Teachers with Advanced Degree	16.096	2.956	.156	5.445	.000
Percent of Teachers Emergency Provisionally Licensed	33.400	23.078	.040	1.447	.148
Percent of Highly Qualified Teachers	37.130	9.273	.168	4.004	.000
Percent of Students Qualifying for Free or Reduced Price Lunches	24.003	1.639	-.483	-14.644	.000
Percent of Average Daily Attendance	49.133	11.431	.175	4.298	.000
Teaching Condition: Managing Student Conduct	7.100	1.386	.185	5.121	.000
Teaching Condition: Professional Development	-7.718	2.020	-.127	-3.822	.000

Adjusted R²=.631

TABLE B-8. MODEL SUMMARY EXPLAINING HIGH SCHOOL STUDENT ACHIEVEMENT CONSTRUCT AREA (N=564)

Coefficients					
Variable	Unstandardized Coefficients		Standardized Coefficients	t	Sig. (P)
	B	Std. Error	Beta		
(Constant)	-28.764	8.968		-3.207	.001
Percent Short-Term Suspensions	-.116	.010	-.378	-11.850	.000
Teacher Attrition	-2.863	6.178	-.013	-.463	.643
Percent of Teachers Emergency Provisionally Licensed	34.928	28.964	.033	1.206	.228
Percent of Students Qualifying for Free or Reduced Price Lunches	-14.449	2.505	-.174	-5.769	.000
Percent of Average Daily Attendance	104.535	6.365	.482	16.424	.000
Teaching Condition: Managing Student Conduct	3.225	2.344	.053	1.376	.169
Teaching Condition: Professional Development	3.417	3.028	.043	1.129	.260

Adjusted R²=.598

Appendix C. Teacher Attrition

positively, the teacher retention rate increases. Table C-1 presents factors the model identified as significant as well.

Statewide Composite

Table C-1 presents OLS model (3). The model demonstrates that as teachers view their school's teaching conditions more

TABLE C-1. MODEL SUMMARY EXPLAINING STATEWIDE TEACHER ATTRITION MEAN COMPOSITE (N=2,227)					
Variable	Coefficients			t	Sig. (P)
	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta		
(Constant)	-.234	.099		-2.366	.018
Age of Books in School	.001	.000	.064	3.422	.001
Instructional Computers per Student	-.003	.001	-.045	-2.348	.019
Percent Classroom Internet Connectivity	.189	.083	.045	2.267	.024
Percent Short-Term Suspensions	.000	.000	.139	5.129	.000
Percent Crime	.005	.001	.088	3.644	.000
Percent Novice Teachers (Years 0–3)	.268	.014	.367	18.497	.000
Percent of Teachers Emergency Provisionally Licensed	.201	.090	.041	2.218	.027
Percent of Lateral Entry Teachers	.198	.043	.094	4.635	.000
Percent of Students Qualifying for Free or Reduced Price Lunches	.017	.006	.058	2.898	.004
Percent of Average Daily Attendance	.108	.042	.054	2.582	.010
Teaching Condition: Overall Composite	-.007	.006	-.021	-1.092	.275
Adjusted R ² =.257					

Statewide by TELL Construct

Models at the state level that included the individual teaching conditions show that the Community Support and Involvement, Managing Student Conduct, and Teacher

Leadership constructs have a significant and consistently positive association with teacher retention. School Leadership has a significant and negative association with teacher retention (positive with teacher attrition). See Table C-2.

TABLE C-2. MODEL SUMMARY EXPLAINING STATEWIDE TEACHER ATTRITION CONSTRUCT AREA (N=2,227)

Variable	Unstandardized Coefficients		Standardized Coefficients	t	Sig. (P)
	B	Std. Error	Beta		
	(Constant)	-.180	.098		-1.845
Age of Books in School	.001	.000	.061	3.310	.001
Percent Classroom Internet Connectivity	.191	.082	.046	2.324	.020
Percent Short-Term Suspensions	.000	.000	.134	4.993	.000
Percent Crime	.004	.001	.071	2.966	.003
Percent Novice Teachers (Years 0–3)	.262	.014	.360	18.280	.000
Percent of Teachers Emergency Provisionally Licensed	.206	.089	.042	2.307	.021
Percent of Lateral Entry Teachers	.188	.043	.089	4.406	.000
Percent of Average Daily Attendance	.098	.041	.050	2.375	.018
Teaching Condition: Community Support & Involvement	-.031	.008	-.114	-3.932	.000
Teaching Condition: Managing Student Conduct	-.019	.008	-.080	-2.383	.017
Teaching Condition: Teacher Leadership	-.060	.015	-.211	-3.992	.000
Teaching Condition: School Leadership	.089	.015	.336	5.930	.000
Adjusted R ² =.269					

School Level Composite

When evaluating the teaching conditions composite variable at the individual school level against teacher attrition, models

failed to show results. This nonfinding suggests that working conditions generally are not influencing teacher attrition, but further analyses at the construct level does explain variation in the models. See Tables C-3–C-8.

TABLE C-3. MODEL SUMMARY EXPLAINING ELEMENTARY SCHOOL TEACHER ATTRITION COMPOSITE (N=1,289)

Variable	Unstandardized Coefficients		Standardized Coefficients	t	Sig. (P)
	B	Std. Error	Beta		
	(Constant)	.335	.314		1.067
Average Daily Membership	-1.129E-05	.000	-.031	-.856	.392
Age of Books in School	.000	.001	.022	.811	.417
Instructional Computers per Student	-.001	.001	-.013	-.475	.635
Books per Student	-4.586E-05	.000	-.008	-.260	.795
Percent Classroom Internet Connectivity	.081	.152	.013	.534	.594
Percent Short-Term Suspensions	.001	.000	.108	3.733	.000
Percent Crime	.011	.004	.070	2.702	.007
Percent Fully Licensed Teachers	-.396	.140	-.166	2.820	.005
Percent Novice Teachers (Years 0–3)	.236	.019	.348	12.290	.000
Percent National Board Certified Teachers	-.001	.001	-.030	-.951	.342
Percent of Teachers with Advanced Degree	.017	.018	.026	.946	.344
Percent of Teachers Emergency Provisionally Licensed	-.260	.200	-.046	-1.298	.194
Percent of Lateral Entry Teachers	-.187	.163	-.061	-1.147	.252
Percent of Highly Qualified Teachers	.117	.132	.023	.884	.377
Percent of Students Qualifying for Free or Reduced Price Lunches	.014	.009	.048	1.466	.143
Percent of Average Daily Attendance	-.072	.256	-.008	-.282	.778
Teaching Condition: Overall Composite	-.006	.009	-.017	-.664	.507

Adjusted R²=.219

TABLE C-4. MODEL SUMMARY EXPLAINING MIDDLE SCHOOL TEACHER ATTRITION COMPOSITE (N=530)

Coefficients					
Variable	Unstandardized Coefficients		Standardized Coefficients	t	Sig. (P)
	B	Std. Error	Beta		
(Constant)	.057	.041		1.388	.166
Age of Books in School	.003	.001	.130	3.611	.000
Percent Short-Term Suspensions	.001	.000	.277	7.331	.000
Percent Novice Teachers (Years 0–3)	.291	.026	.414	11.297	.000
Teaching Condition: Overall Composite	-.015	.013	-.042	-1.129	.259

Adjusted R²=.325

TABLE C-5. MODEL SUMMARY EXPLAINING HIGH SCHOOL TEACHER ATTRITION COMPOSITE (N=564)

Coefficients					
Variable	Unstandardized Coefficients		Standardized Coefficients	t	Sig. (P)
	B	Std. Error	Beta		
(Constant)	.094	.058		1.628	.104
Percent Novice Teachers (Years 0–3)	.195	.034	.246	5.748	.000
Percent of Lateral Entry Teachers	.318	.073	.188	4.362	.000
Percent of Average Daily Attendance	.006	.038	.006	.159	.874
Teaching Condition: Overall Composite	-.002	.015	-.005	-.128	.898

Adjusted R²=.125

School Level by TELL Construct

At all school levels, varying conditions, including the Community Support and Involvement, Managing Student

Conduct, and Teacher Leadership constructs effect a teacher's decision to continue teaching in their school. School Leadership is found at all levels to expedite a teacher's desire to leave. See Tables C-6–C-8 for full models.

TABLE C-6. MODEL SUMMARY EXPLAINING ELEMENTARY SCHOOL TEACHER ATTRITION CONSTRUCT AREA (N=1,297)

Coefficients					
Variable	Unstandardized Coefficients		Standardized Coefficients	t	Sig. (P)
	B	Std. Error	Beta		
(Constant)	.086	.023		3.775	.000
Percent Short-Term Suspensions	.001	.000	.158	6.077	.000
Percent Novice Teachers (Years 0–3)	.263	.017	.388	15.343	.000
Teaching Condition: Managing Student Conduct	-.030	.011	-.117	-2.805	.005
Teaching Condition: Teacher Leadership	-.065	.018	-.237	-3.560	.000
Teaching Condition: School Leadership	.085	.019	.331	4.555	.000
Adjusted R ² =.229					

TABLE C-6. MODEL SUMMARY EXPLAINING MIDDLE SCHOOL TEACHER ATTRITION CONSTRUCT AREA (N=530)

Coefficients					
Variable	Unstandardized Coefficients		Standardized Coefficients	t	Sig. (P)
	B	Std. Error	Beta		
(Constant)	.074	.035		2.108	.035
Age of Books in School	.002	.001	.124	3.459	.001
Percent Short-Term Suspensions	.001	.000	.279	7.480	.000
Percent Novice Teachers (Years 0–3)	.287	.026	.409	11.251	.000
Teaching Condition: Teacher Leadership	-.086	.030	-.299	-2.894	.004
Teaching Condition: School Leadership	.067	.028	.246	2.378	.018
Adjusted R ² =.333					

TABLE C-8. MODEL SUMMARY EXPLAINING HIGH SCHOOL TEACHER ATTRITION CONSTRUCT AREA (N=564)

Coefficients					
Variable	Unstandardized Coefficients		Standardized Coefficients	t	Sig. (P)
	B	Std. Error	Beta		
(Constant)	.162	.056		2.909	.004
Percent Novice Teachers (Years 0–3)	.169	.034	.213	4.964	.000
Percent of Lateral Entry Teachers	.301	.072	.178	4.163	.000
Percent of Average Daily Attendance	.027	.038	.028	.719	.472
Teaching Condition: Community Support & Involvement	-.083	.019	-.231	-4.321	.000
Teaching Condition: School Leadership	.052	.017	.165	3.126	.002

Adjusted R²=.152

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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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