

## **Validity and Reliability of the North Carolina Teacher Working Conditions Survey**

The analysis presented throughout the report are based on the responses to the 2008 North Carolina Teacher Working Conditions (TWC) Survey, which has been revised from past iterations (2002, 2004 and 2006) with the input from a variety of key stakeholders, policymakers and educators on the North Carolina Professional Teaching Standards Commission, the Governor’s Teacher Advisory Council and the State Board appointed Teacher Working Conditions Advisory Board. Analyses of the psychometric soundness of the NC TWC Survey indicate that it is a reliable and valid measure of the presence of teaching conditions in participating schools.

### **Validity of North Carolina Teacher Working Conditions Survey**

Examining the validity of the North Carolina TWC Survey addresses questions of whether the instrument is a true measure of what it is attempting to assess; in this case the presence of teacher working conditions.

#### **Content Validity**

The North Carolina Teacher Working Conditions Survey is based on past iterations of the survey first developed in North Carolina. In creating the first working conditions survey in 2001, the North Carolina Professional Teaching Standards Commission (NCPTSC) completed a literature review of the role of working conditions on teacher dissatisfaction and which of those conditions contributed to teacher mobility. The work, driven by analyses of state and national survey data from the National Center for Education Statistics’ School and Staffing Survey, focused on areas that teachers identified as conditions that drove their satisfaction and employment decisions, including administrative support, autonomy in making decisions, school safety, class size, time, etc. The NCPTSC created 30 state working conditions standards passed by the North Carolina State Board of Education (online at [www.ncptsc.org](http://www.ncptsc.org)) in five areas: time, empowerment, leadership, time, and facilities and resources.

While the list is by no means exhaustive, those 30 standards served as the foundation for the first survey in North Carolina in 2002 on which the 2004, 2006 and 2008 North Carolina surveys are based. The survey was designed to assess whether or not educators believed that those standards were in place in schools across the state. It is why every educator is assessed and the unit of analysis is the school.

In 2004, the survey was expanded from 39 question paper/pencil survey on a 1 to 6 scale to a 72 question online survey with likert questions re-scaled fro 1 to 5. Many of the items were “reality”

questions, drawn from the National Center for Education Statistics School and Staffing Survey, to see if teachers' reporting of issues such as non-instructional time and professional development received had an impact on their perceptions of whether supportive working conditions were in place.

- In 2004, a sample of educators was asked to rank on an ordinal scale the relevance and importance of each question on the 2004 instrument. Those questions were then compared to the factor analyses to verify the importance of a set of critical conditions in each area of the survey. The questions rated as most important also had the highest factor loads and most make up the battery of core questions still used in 2006 and 2008 in North Carolina and other states.
- Correlations were run between the perceptual and “reality” questions on the survey to better understand teaching conditions. There were statistically significant and meaningful correlations between teachers' perception of time and how much planning time they received and how many hours outside of the school day they worked. In South Carolina, where more than 160 variables were made available to triangulate the data, it was found that teachers were more negative about the availability of resources when a higher proportion of students were taught in portable classrooms, etc. (Hirsch, 2005)
- Through presentations and technical assistance to thousands of educators in North Carolina and across the nation, feedback on the wording of the questions and other areas to assess has been gathered and utilized to improve the survey instrument.

The 2008 North Carolina TWC Survey is based on the state's 2004 and 2006 instruments with minor revisions. The same general core constructs have been utilized since 2002, although a section on beginning teacher support only for those teachers in their first three years in the profession was added in 2006 and items for principals only that assess district support were asked in 2008.

### **Construct Validity**

To assess the survey to the degree it measures the five theoretical constructs on which it is designed—time, facilities and resources, professional development, school leadership and educator leadership—a factor analysis on the data set was conducted to determine if the items separated into five distinct factors or areas of focus. This would be expected if each of the five areas were independent standards. However, previous analyses of similar teaching conditions surveys indicated strong overlap between the school leadership and educator leadership sections of the survey.

Using a principal components analysis and varimax rotation procedures, eigenvalues of one or greater were used as the criteria for factor extraction. In the 2008 North Carolina TWC Survey, a five factor model was found.

- The Leadership factor includes questions from the school leadership and educator leadership sections. The top ten questions were selected to represent the factor (Q5.1a,

Q5.1c, Q5.1e, Q5.1f, Q5.1h, Q5.1j Q5.1l, Q5.1m, Q5.1n, Q5.3e), all with factor loads over 0.70 with 25 questions loading on to the factor at a .5 level or above.

- The Facilities and Resources factor is the average of the 8 questions from the Facilities and Resources section of the survey that were most important in explaining the presence of important resources such as instructional materials, communications technology, office equipment, and a clean safe environment, all with factor loads over .5. (Q3.1a, Q3.1b, Q3.1c, Q3.1d, Q3.1e, Q3.1f, Q3.1g, Q3.1h).
- The Professional Development factor is the average of the 5 questions from the Professional Development section of the survey that were most important in explaining the resources and opportunities available for teachers to participate in professional development , all with factor loads over .6 (Q6.1a, Q6.1b, Q6.1c, Q6.1d, Q6.1e).
- The Time factor is the average of the 5 questions from the Time section of the survey that were most important in explaining the presence of impediments on teacher's time to plan and collaborate, all with factor loads over .5 (Q2.1a, Q2.1b, Q2.1c, Q2.1d, Q2.1e). The
- Decision making factor includes a set of questions within the educator leadership section with factor loads over .55 (Q4.3a, Q4.3b, Q4.3c, Q4.3d, Q4.3e, Q4.3f, Q4.3g, Q4.3h) that describing the extent of the role that teachers play in decision making about teaching, classroom and school issues.

These results indicate that the survey sections are well suited in North Carolina to reflecting the focus area of each major concept generated through the factor analyses. There was, however, some overlap between items in the educator leadership and school leadership sections of the survey as constructed. This has occurred in previous iterations of the survey and is why the section previously titled “empowerment” was changed in 2008 to “educator leadership.” It appears the quality of school leadership is related to the engagement of teachers in decision making and there feelings of efficacy.

### **Predictive Validity**

Analyses between the North Carolina Teacher Working Conditions instrument, teacher retention and student achievement data demonstrate that the presence of positive teacher working conditions, as measured by the NC TWC Survey, were connected to student learning and teacher retention (Hirsch and Emerick, 2007). As noted in the 2006 report, significant and often strong connections were documented between success on the ABC performance composite, achieving or exceeding expected growth, and certain conditions of work being present in a school. Of critical importance is the perception that the faculty is committed to helping all children learn, significant at both the elementary and secondary level. Having a safe and supportive environment with sufficient instructional resources is a necessity for teachers to be successful with students.

Further in analyzing the connections in 2006 between future employment plans, actual attrition and teaching conditions, several important findings were documented. Effective leadership that

provides sufficient planning time and empowers teachers in a trusting environment where they feel supportive was the key ingredient to lowering teacher turnover and creating climates where all students can succeed. Ensuring that teachers are respected as educational experts appears to be particularly important as it was the greatest predictor of future employment plans at both the elementary and high school levels. Additionally, finding time for educators to focus on instruction is a critical component to teacher satisfaction. For more information see Eric Hirsch and Scott Emerick with Keri Church, Ed Fuller, “Teacher Working Conditions Are Student Learning Conditions: A Report on the 2006 North Carolina Teacher Working Conditions Survey.” Chapel Hill, NC: Center for Teaching Quality, 2007. Online at: <http://ncteachingconditions.org/research/twnc2006.pdf> . Analyses presented from 2008 confirm these connections.

### Reliability of North Carolina TWC Survey

Reliability refers to the consistency of measurement. Analyses were conducted measuring the reliability (consistency) of the TWC Survey for measuring the presence of various components of teaching conditions. Reliability was assessed for subscales within the survey on the five identified factors of the survey.

In order to test the internal consistency of the five major factors utilized in the North Carolina TWC report (leadership, professional development, facilities and resources, decision making, and time), Cronbach’s alphas were run on teacher responses. An alpha coefficient ranges from 0 to 1 with higher coefficients indicating higher levels of instrument consistency. ***All five factors are reliable with alphas above 0.8.*** The leadership factor had an excellent level (0.929) of internal consistency. The four remaining factors all had very good levels of reliability: professional development (0.866), facilities and resources (0.852), educator leadership (0.841), and time (0.810) (Table 1).

**Table 1**  
**Reliability Statistics for Survey Reorganized Around Major Factors**

Factors	Cronbach’s Alpha	Cronbach’s Alpha Based on Standardized Items	Inter-Item Correlations	N of Items	Sample Size
Leadership	0.929	0.930	0.624	10	85,087
Professional Development	0.866	0.867	0.521	8	87,302
Facilities & Resources	0.852	0.852	0.419	8	85,492
Decision making	0.841	0.841	0.398	8	84,080
Time	0.810	0.810	0.461	5	86,341

**Note:** Table is organized in descending order by the Cronbach's alpha based on standardized items. Cronbach's alpha is a measure of internal consistency. It is a means of testing reliability that requires a single test administration to provide a unique estimate of the reliability for a given test in the absence of being able to conduct a test-retest method, which is impractical in many cases. Alpha is the average value of the reliability coefficients one would obtain for all possible combinations of scaled items when split into two half-tests. The internal consistency estimates attempt to determine how consistently individuals respond to the items measured on a scale. The more consistent within-subject responses are, and the greater the variability between subjects in the sample, the higher the Alpha produced. Alphas. It is important to note that Cronbach's alpha does not provide reliability for single survey items.