

TVAAS:

An Introduction to Value-Added in Tennessee

In its 2009 report, *Roadmap to Success*, SCORE highlighted the importance of using data to enhance student learning. SCORE encouraged the state to expand access to and use of the Tennessee Value-Added Assessment System (TVAAS), which tracks student achievement from year to year to determine the learning growth students experience over time. TVAAS is an important tool that helps schools craft individual supports for students in the areas where they need it most, as well as evaluate and support teachers in their own improvement and professional growth. This issue brief provides an overview of how TVAAS is calculated and its role in the education landscape in the state.

What is TVAAS?

TVAAS is not a test administered in addition to other state mandated tests, such as Tennessee Comprehensive Assessment Program (TCAP), End-Of-Course, or the EXPLORE, PLAN, and ACT exams. Instead, TVAAS is a measurement of student academic progress that is based on the results of these tests. The distinction between achievement and growth is essential to understanding the role of TVAAS, or any value-added assessment system. Achievement generally indicates a student's demonstrated mastery of content on one examination, such as an End-Of-Course standardized exam or the National Assessment of Educational Progress (NAEP). Achievement levels tend to be oriented around levels of proficiency with course material, such as Below Basic, Basic, Proficient, and Advanced. Growth refers to the amount of learning a student gains over a period of time. Value-added seeks to draw from a variety of measures of academic achievement in order to demonstrate growth over time. Value-added data are used to inform instructional practice and interventions, in addition to teacher, school, and district accountability. In order to evaluate a district, school, or teacher's

Achievement vs. Growth

Achievement – Measures student performance at one point in time based on a defined level of proficiency using a standardized assessment (e.g., TCAP test result)

Growth – Measures student learning over a period of time, taking into account the student's prior performance

effectiveness for students in grades 3 through 8, progress on the TCAP is compared to the average progress of all Tennessee students in those grades. If the average progress for a district, school, or teacher is the same or greater than the state's average over the previous three years, the district, school, or teacher is considered to be effective. At the high school level, a district, school, or teacher's effects on student progress are compared to the average district, school, or teacher in the current year. High school analyses are designed to accommodate for varying testing schedules for those students. These analyses are based on all the students' previous test scores in all subjects.

Calculating and Reporting TVAAS

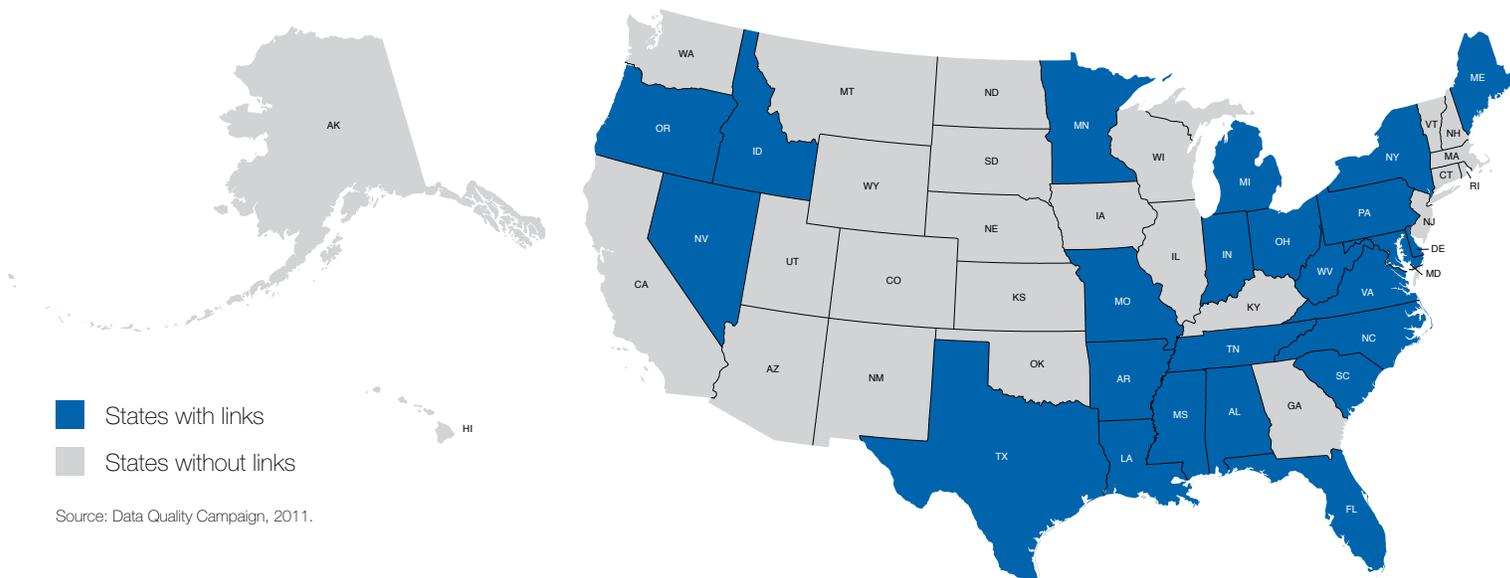
TCAP is currently the major source of data used in the TVAAS system, as all students in grades 3 through 8 take these tests in four subject areas: reading/language arts, math, science, and social studies. TVAAS scores in high schools are drawn from student end of course exams and the ACT testing series. This series of exams includes the EXPLORE and PLAN tests administered in the eighth and 10th grades, respectively, as well as the ACT administered to every Tennessee student during 11th grade.

After scores are calculated, results are sent to the SAS Institute®, where they are matched with a teacher-student linkage file from RANDA Solutions, a Nashville-based data analysis corporation, to calculate teacher-effect data. TCAP results are determined and compared to the state's standard level of growth to determine a school's value-added status. The high school results are determined and compared to the effectiveness of the average Tennessee school or teacher.^v School level scores are then publicly available online through the Tennessee Department of Education's Report Card.

Brief History of Value-Added Assessment

In 1992, Governor Ned McWherter signed into law the Education Improvement Act (EIA), which provided a significant increase in state funding for public education and required the use of new accountability measures for districts, schools, and teachers based on student performance outcomes. This legislation enabled the state to track the educational value provided at the classroom, school, and district levels by measures including student test results. Dr. William Sanders, then a professor at the University of Tennessee-Knoxville, pioneered value-

States linking student achievement and teacher effectiveness



added models of student learning in the 1980s. His methodology was adopted for Tennessee's analyses and became known as TVAAS. By adopting TVAAS, Tennessee became the first state to use a value-added system of measuring student academic progress as an indicator of the impact of teachers, schools, and districts on that progress. At that time, the law mandated TVAAS scores be a component of every teacher's evaluation, but individual districts determined the weighting TVAAS scores received.ⁱ

Passage of the No Child Left Behind Act of 2001 tied federal funding in support of public education to student academic progress. The law required all states to test all students in grades 3 through 8 in reading and math to determine whether students and schools were making "adequate yearly progress." This mandate led states to develop comprehensive databases of student test scores—the first step in implementing a value-added system. With access to these data, some states, and even some districts, created their own methods of evaluating schooling influences.ⁱⁱ These methods varied widely in data sources used, the number of years of individual student data analyzed, the statistical methodology used, and the reliability of the results of the analyses. Other states are now using models patterned after TVAAS. According to a survey conducted by the Data Quality Campaign in 2011, the majority of states had developed data systems linking student achievement to some type of teacher-level effects. The map above indicates which states nationally have and have not developed systems linking student achievement to individual teachers as a way to provide a progress or effectiveness measure for individual teachers.ⁱⁱⁱ

TVAAS and Its Uses

TVAAS results are most commonly used by policymakers for accountability, by educators in their practice to improve the chances of students receiving appropriate opportunities for growth each year, and by researchers to identify accelerators and impediments of student progress. Key findings from that research include the importance of highly effective teachers in improving achievement, closing achievement gaps, and increasing college and workplace readiness.

Accountability has become an increasingly prevalent issue in public education since the 1983 release of *A Nation at Risk*, which presented a forceful case that schools in America were failing to provide the kind of education students would need to succeed in the modern economy. Since standardized assessment results from a single year are highly related to factors beyond the control of educators, and many educators felt them to be an unfair indicator for use in evaluating schools and teachers, value-added approaches offered an alternative. As standardized assessments have been associated with increasingly high stakes for students in their educational advancement and personnel decisions in schools and districts, Tennessee's state leaders have looked to the TVAAS statistical models as reliable indicators of instructional quality and adequate educational opportunity for students.

One measure of the usefulness of a value-added measure is a determination of how well it would predict future performance, particularly in the case of teachers. A TVAAS measure that includes up to three years of assigned students is more likely to predict the future performance of a teacher. For example, a three-year average value-added estimate is more likely to be repeated in subsequent years than a two-year average or a single year result. Likewise, a two-year average is more likely to

reoccur than a single year estimate.

In Tennessee, 50 percent of a teacher's performance evaluation must be tied to indicators of student achievement and growth, including 35 percent based on the teacher's TVAAS scores, when available. The First to the Top Act of 2010 required the inclusion of TVAAS data as part of the state's approach to teacher evaluation. In grades and subject areas for which TVAAS scores are not available, the state's system currently applies the school-wide average TVAAS score. The Tennessee Department of Education is now working to determine additional measures to ensure fair use of student data in evaluations for all teachers.

In Tennessee, state, district, and school leaders also express interest in equipping teachers with the skills needed to examine value-added data. Once teachers acquire these skills, they can identify areas in which individual students may need extra support or where classes are struggling to master material. The ability to identify areas of need enables teachers to intervene to address them. Teachers in schools participating in the Teacher Advancement Program (TAP), for example, regularly examine the value-added data of their colleagues to find areas of needed instructional support or professional development. TAP teachers also draw from value-added data for student sub-groups (e.g., high, medium, and low achievers) to identify needed instructional adjustments to support academic growth of students across all achievement levels.^{iv}

Addressing Common Concerns about TVAAS

Although TVAAS has value as a tool for both identifying areas of need for students, teachers, and schools and contributing to Tennessee's accountability models, some educators, researchers, and policymakers have expressed concerns about the appropriate use of this statistical tool. These concerns have included:

- **TVAAS is too complex a system for non-statisticians to interpret and use.**
- **TVAAS data are made available too late to be used in performance evaluations for the school year in which they were collected.**
- **The lack of individual TVAAS data for teachers in grades and subject areas without standardized assessments means two-thirds of teachers have significant portions of their evaluations based on school-wide TVAAS scores, rather than the growth their own students demonstrate.**
- **Responsibility for student learning growth may be blurred, either as a result of content overlap across subject areas or in team-teaching and distance learning situations.**
- **TVAAS does not fully account for demographic and socioeconomic characteristics that are strongly tied to student performance on standardized assessments.**

Complexity of TVAAS

Any system used in part to evaluate teaching must be nuanced and complex, because the art of teaching is nuanced and complex. In order to capture as accurate an understanding of student learning growth over time as possible, TVAAS employs a highly sophisticated statistical model.^{vi} In addition, Tennessee has partnered with Battelle for Kids to develop extensive "train the trainer" professional development offerings for the state's administrators and teachers in an effort to train educators to use TVAAS information to improve educational outcomes. This process began with training regional value-added specialists. These specialists are district leaders charged with ensuring every school has a principal and teacher who are prepared to communicate TVAAS information to the entire school faculty. First to the Top funding also includes a series of online courses designed to train educators in how to access, customize, and interpret the wide-range of available TVAAS reports. Additional modules will provide guidance to educators on using the reports to inform improved practices at the school and classroom levels.^{vi}

Understanding TVAAS Video Series

The Tennessee Department of Education has produced a series of videos explaining TVAAS, as well as how TVAAS scores are compiled and used in evaluation. The series is posted online at:

<http://team-tn.org/teacher-model>

Resources developed by the Tennessee Department of Education will continue to build on those already available to deepen educator understanding of TVAAS and how to make use of TVAAS reports to improve practice at the classroom, school, and district levels.

Timeliness of TVAAS Data Reporting

In recent years, the Department has worked with vendors responsible for data collection and interpretation to move up the availability date of TVAAS for a school year from well into the following fall to, in 2012, mid-June. Legislative mandates determine when TCAP assessments may be administered, which affects the subsequent date by which student scores can be calculated and matched with teachers. The Department must continue the effort to make TVAAS data available as early as possible in order to make best use of the information for both assessing personnel performance and providing opportunities for professional learning that meet the needs of teachers.

Need for More Individual TVAAS Data

As discussed in SCORE's 2012 report, *Supporting Effective Teaching in Tennessee*, the state must continue its work to provide appropriate

value-added measures for as many individual educators as possible, rather than use school-wide averages as placeholders. The Department is now working with districts to develop assessments to increase the number of teachers for whom value-added data are available in 2012-13. Potential areas identified for expanding value-added measures include early grades (K-2), English language learner instruction, world languages, and fine arts.

Blurred Lines of Responsibility for Student Learning Growth

One great benefit of a rigorous educational experience occurs when students draw connections between and apply skills and knowledge acquired from different subject areas in completing work for multiple classes. A complication arises, however, in attributing this learning growth for value-added purposes. Team-teaching and distance learning situations can also lead to questions in determining toward which teacher or teachers students should count in calculating value-added scores. The Department and TVAAS developers should continue to address these practical challenges. Researchers from SAS Institute® have already worked to develop value-added measures for team-teaching and distance learning.

Accounting for the Effects of Student Background on Assessment Performance

Student demographics and socioeconomic status correlate strongly to performance on the kinds of standardized assessments used in value-added calculations. Because TVAAS only indicates the amount of learning growth individual students experience from year to year, however, statistical analyses have demonstrated that including these factors has no significant impact on results.^{viii}

For additional discussion of TVAAS and its use, see SCORE's 2012 report, Supporting Effective Teaching in Tennessee.

<http://www.tnscore.org/wp-content/uploads/2012/06/SCORE-Evaluation-Report.pdf>

TVAAS's Evolving Role

As Tennessee's educational landscape evolves, the role of TVAAS in supporting reforms is expanding. For example, the state now examines the value-added scores of teachers who have graduated from training programs as an indicator of how well programs are preparing teachers for the classroom. Most significantly, TVAAS can also play an important role in informing how teachers individualize instruction to meet the specific learning challenges of their students.

TVAAS can also play an important role as more educators understand the potential of the data as an instructional guide. In the coming years, teachers will further develop their knowledge of TVAAS and regularly

examine student growth data to identify areas in which students are in need of additional support. This increased awareness and use of TVAAS will develop as the state expands access to data and provides opportunities for professional learning in the use of value-added data.^{ix}

Conclusion

State, district, school, and classroom leaders are placing an increasing level of focus on the use of data to drive and improve instructional practice. Tennessee has committed to adopting common assessments with 23 other states to complement the state's implementation of Common Core State Standards in English/Language Arts and mathematics. These assessments will replace TCAP in the 2014-15 school year. The Department and higher education officials must collaborate to continue enhancing the value of TVAAS during this time of transition and into the era of common state assessments.

As educators incorporate TVAAS as one tool for refining practice, ongoing professional development will enhance their capacity to make effective use of these data to, in turn, enhance the learning growth of Tennessee's students.

The State Collaborative on Reforming Education (SCORE) collaboratively supports Tennessee's work to prepare students for college and the workforce. We are an independent, non-profit, and non-partisan advocacy and research institution, founded by former U.S. Senate Majority Leader Bill Frist.

ⁱ Sanders, W., Horn, S. (1998). Research Findings from the Tennessee Value-Added Assessment System (TVAAS) Database: Implications for Educational Evaluation and Research. *Journal of Personnel Evaluation in Education*, 12(3), pp. 247-256. Sanders, W. L., Saxton, A. M., and Horn, S. P. (1997). The Tennessee Value-Added Assessment System: A Quantitative Outcomes-Based Approach to Educational Assessment in J. Millman (Ed.), *Grading Teachers, Grading Schools: Is Student Achievement a Valid Educational Measure?*, pp. 137-162. Thousand Oaks, CA: Corwin Press.

ⁱⁱ Braun, H. (2005). *Using Student-Progress to Evaluate Teachers: A Primer on Value-Added Models*. Educational Testing Service.

ⁱⁱⁱ Data Quality Campaign, 2011.

^{iv} TAP. (2012). Retrieved from <http://www.tapsystem.org/policyresearch/policyresearch.ta?page=valueadded>.

^v SAS. (2011). *What should teachers know about TVAAS student probabilities?* Retrieved from <https://tvaas.sas.com/>.

^{vi} McCaffrey, D., Lockwood, J.R., Koretz, D., et al. (2004). *Models for Value-Added Modeling of Teacher Effects*. *Journal of Educational and Behavioral Statistics*, 29(1), pp. 67-101.

^{vii} Tennessee First to the Top. (2011). *The Power of Using Value-Added Analysis to Improve Student Learning: A Guide for Educators*. Retrieved March 2012 from http://team-tn.org/assets/educator-resources/Power_of_Using_VA.pdf.

^{viii} Ballou, D., Sanders, W., and Wright, P. (2004). *Controlling for Student Background in Value-Added Assessment of Teachers*. *Journal of Educational and Behavioral Statistics*, 29(1), pp. 37-65.

^{ix} Stone, J. (2010). *Why Tennessee Won: Tennessee's Watershed RTTT Reforms and the Pace for the Rest*. Education Consumers Foundation. Retrieved March 2012 from http://www.education-consumers.org/RTTT_Commentary.htm.