Introduction

Beginning with the 2015-16 report cards, as legislatively required, the Growth Priority Area calculation has been based on a value-added growth model. Prior to 2015-16, Student Growth Percentiles (SGPs) were used to measure student growth in schools. Value-added scores and SGPs both measure how rapidly students are gaining knowledge and skills from year to year, focusing on the pace of improvement in student performance. Whereas SGPs measure student growth relative to students with similar achievement histories, value-added models allow for the inclusion of additional demographic information to pinpoint how much a particular school or district contributed to student growth. This FAQ will help guide you through understanding the value-added model used in the report cards and answer commonly asked questions.

Understanding Value-Added

What is value-added?

Value-added is a type of student growth model that measures student improvement on state standardized assessments in comparison to similar students from one year to the next. Like all growth models, value-added models look at growth over time, focusing on the pace of improvement in student performance among similar groups of students. Value-added models try to pinpoint how much a particular school or district contributed to that improvement. Specifically, the value-added model is designed to identify and measure the difference between predicted growth and actual growth for students. This difference is the additional value a school or district adds to changes in student achievement over time.

Value-added quantifies how much growth students make over time after applying statistical controls for factors that are generally beyond a school's influence but may be related to how much growth students make (see below). This is meant to facilitate "apples to apples" comparisons of school performance between schools that often serve very different student populations. The measure reflects growth across the entire spectrum of student performance, regardless of a student's starting achievement level.

What factors into the value-added model?

The value-added model controls for two main factors: (1) prior test scores and (2) demographic characteristics:

1. *Prior test scores:* The value-added model includes English language arts (ELA) and mathematics test scores from the prior year to account for students' starting achievement levels. These prior-year scores are what make value-added a method for estimating growth, rather than just a point-in-time

snapshot of student performance. Whenever possible in the report cards, we use more than one year of prior scores. For the 2017-18 report cards, three years of value-added data are available for many (but not all) schools. In these cases, the available years of value-added scores (calculated as a weighted average) will be aggregated to a multi-year value-added score.

2. *Demographic controls:* The value-added model also controls for certain demographic characteristics that have been found to be correlated with of student performance and growth on state assessments. These characteristics fall under six domains: economically disadvantaged status (ECD), English proficiency, race/ethnicity, disability status, gender, and migrant status. The specific categories within each domain are displayed in the table below.

	Student Characteristic Controls					
	ECD	English Proficiency	Race/Ethnicity	Disability Category	Gender*	Migrant*
Categories included in Value-Added Model	Yes	1 - EL Beginning Preproduction	American Indian/Alaska Native	Emotional/behavioral disability (EBD)	Male	Yes
	No	2 - EL Beginning Production	Asian	Learning or intellectual disability (LD/ID)	Female	No
		3 - EL Intermediate	Black/African American	Autism (A)		
		4 - EL Advanced Intermediate	Hispanic/ Latino	Speech/language disability (SL)		
		5 - EL Advanced	Two or more races	Other disability type		
		6 - Formerly EL (FEL), now fully English proficient	Native Hawaiian/Pacific Islander	No disability		
		7 - Fully English proficient, never EL	White			

* Gender and migrant status are included as controls in the value-added model, though they are not subgroups reported on or otherwise included in Wisconsin's state accountability system.

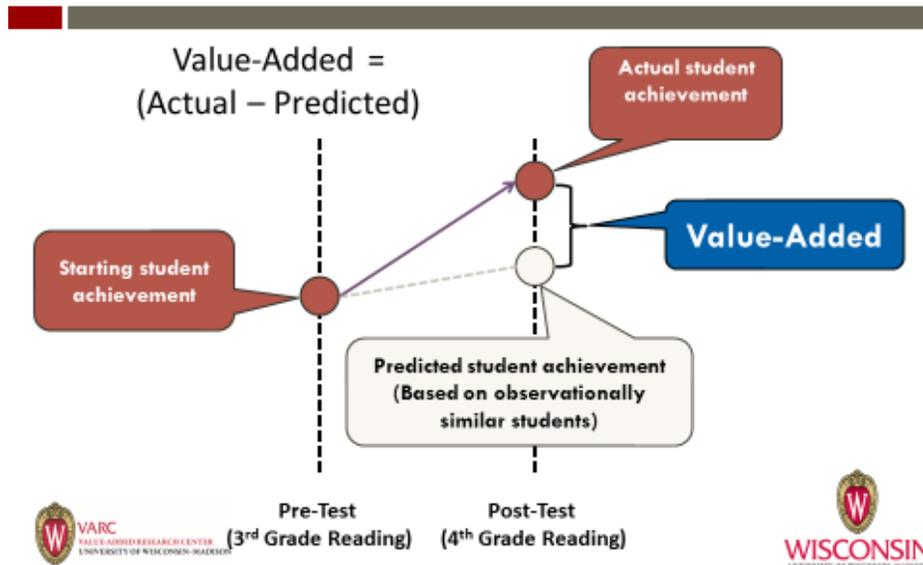## How does the value-added calculation work?

Value-added uses a student's prior year test scores as the starting point, controlling for demographic characteristics, and compares the student's performance to others like him or her. Value-added models predict what a student's post-test score would be (his or her *predicted* growth), assuming that the student was in the average school, and compares it to his or her *actual* growth over time.

In short, value-added works as such:

- Value-added starts with one (or more, if available) pre-test scores, such as a 3rd grade ELA score, to generate predictions of how much growth a student is likely to make based on his or her prior test score history. When a second post-test score, such as a 4th grade ELA score, is available, the actual scores of students within a school are compared to their predicted scores.
- If, collectively, the school's actual scores are higher than predicted scores, we call this high value-added, meaning that the school produced more growth than schools that serve similar student populations.

- The value-added model also includes a statistical correction for natural variation in scores on standardized assessments. Such fluctuation in scores is especially common among students with very low or very high scores.
- Value-added scores are reported on a 1-6 range, and 3 is always set as the average. Analysts from the Office of Educational Accountability (OEA) then calculate report card Growth scores, which is a 0-100 range.

Value-Added: A Visual Representation

Value-Added = (Actual − Predicted)

Actual student achievement

Value-Added

Starting student achievement

Predicted student achievement (Based on observationally similar students)

VARC
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Pre-Test (3rd Grade Reading)　　Post-Test (4th Grade Reading)

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Isn't it harder to demonstrate higher test score growth between some grades than others?
Yes, achieving one test score point of growth is more difficult in some grades than others, which puts growth scores for different grades on different scales. The value-added model standardizes test scores across grades to facilitate growth comparison between different grades. Standardization brings all grades onto a shared scale. Standardized value-added scores are calculated by dividing the raw value-added score by the standard deviation of value-added scores across districts or schools respectively. This does not affect the statistical power of the model or the ranking of estimated school or district effects.

For a more detailed description of the inner workings of the value-added model used in Wisconsin's accountability system, please see the Value-Added Technical Report, available here.

Value-Added in the Growth Priority Area

How are value-added scores used in the report cards?

The Growth Priority Area provides a single score that characterizes the growth of students in a particular district or school regardless of their prior achievement levels. On the Growth detail page of the report card, two scores are reported: a Value-Added Score (generally scores are 1-5; occasionally scores fall below 1 and above 5) and a Growth Score (0-100). The value-added score is a weighted average of three value-added growth intervals for both English language arts (ELA) and mathematics content areas:

(1) value-added scores from 2017-18, which use 2017-18 and 2016-17 Forward results
(2) value-added scores from 2016-17, which use 2016-17 and 2015-16 Forward results
(3) value-added scores from 2015-16, which use 2015-16 Forward and 2014-15 Badger results

As in other parts of the report card, the current year is weighted more heavily than prior years' data.

How does the Value-Added Score compare to the Growth Score?

The Value-Added Score and Growth Score are related, in that the Value-Added Score is used to determine the Growth Score. DPI takes the value-added scores that are on a 1 to 5 point scale, provided by VARC, and transforms them onto a 0 to 100 point scale to align with the other Priority Areas (see the Report Card Technical Guide for details on the score conversion). The value-added score DPI receives is based on a weighted average of 2016-17 value-added scores and 2017-18 results, with the current year weighted more than the prior year's value-added. A school or district's Growth Score is then used in calculating its Overall Score.

How is the Value-Added Score interpreted?

The best way to understand your value-added score is by comparison to the statewide mean score and the spread of value-added scores across Wisconsin schools or districts. In short, anything above the statewide mean of 3 indicates better than average growth; anything below 3 indicates lower than average growth. Value-added scores generally range from 1 to 5, with 3 being average. While rare, a value-added score can extend below 1 or above 5 when growth is much higher or lower than expected.

Since value-added calculations measure the difference between the predicted growth and actual growth of students, a Value-Added Score of 3 suggests that student growth in a school or district is on par with what one might expect based on the average school in the state and the prior achievement and select characteristics of these students. Scores higher than 3 indicate that a school or district has high value-added, meaning that the value the school or district provided to student growth was higher than predicted. Value-added scores less than 3 are indicative of low value-added.

Here are some basic interpretive guideposts:
- The value-added scale ranges from approximately 0 to 6.
- The state average is set at 3.
- Most schools fall between 2 and 4.
- Nearly all schools fall between 1 and 5.
- Only about 0.5% of schools (and no districts) have an estimate less than 0 or more than 6.

The table and figures below illustrate the distribution of value-added scores in the 2016-17 report cards. District value-added scores have a narrower spread than school value-added scores, as the vast majority of district scores are between 2 and 4. A larger percentage of schools than districts have value-added scores of less than 1 or more than 5.
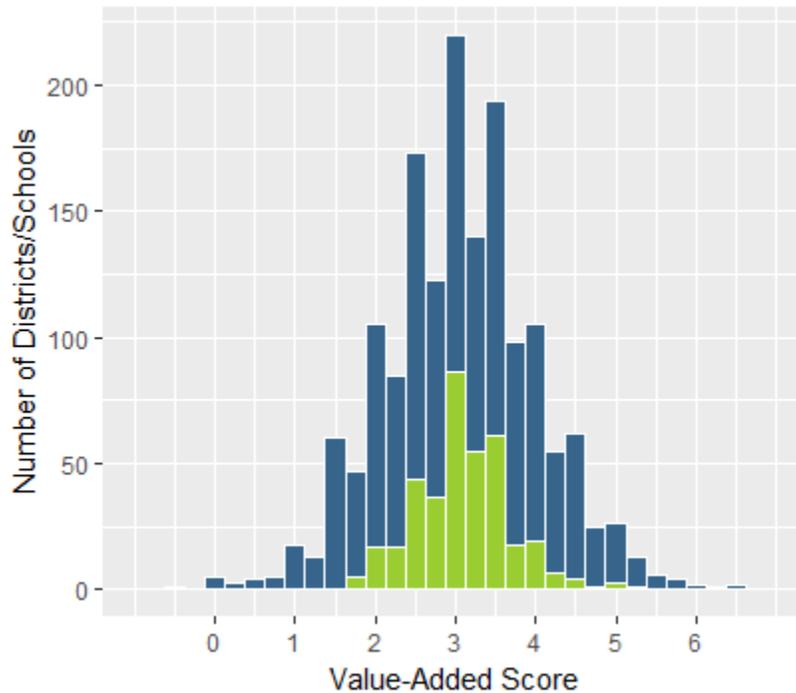
2017-18 School and District Value-Added Scores, By Subject

Value-Added Score	District Level		School Level	
	ELA	Mathematics	ELA	Mathematics
Between 2 and 4	90.9%	92.3%	76.4%	73.6%
Between 1 and 5	99.5%	99.5%	96.4%	96.4%
Between 0 and 6	100.0%	100.0%	99.6%	99.4%

2017-18 ELA Value-Added Scores: Schools and Districts
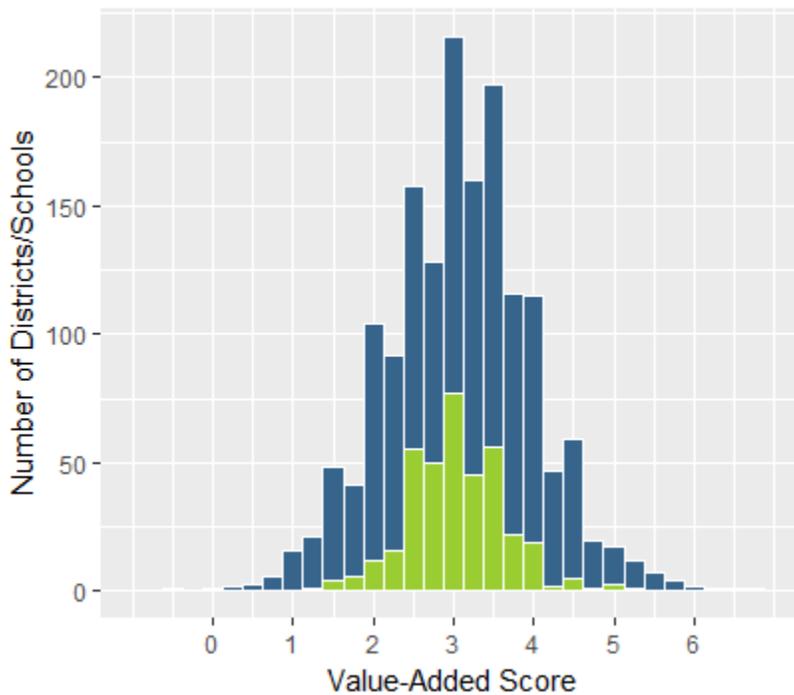
2017-18 Mathematics Value-Added Scores: Schools and Districts

Common Questions

Which students are included when calculating the value-added score for my school or district?
Only students identified as full academic year (FAY) students for your school or district are included in the value-added calculation. Value-added scores for the 2015-16 school year include FAY students who took both the Badger Exam in 2015 and the Forward Exam in 2016; scores for the 2016-17 school year include FAY students who took the Forward Exam in both 2016 and 2017.

- Students must have prior year scores in both ELA and mathematics to be included in each school year's value-added score, as these scores serve as pre-test measures. In addition, the two test scores must be from consecutive grades.
- Students' pre-test scores may come from another school. Students who are FAY and have test scores for both years are included in the value-added calculation for the school at which they took the test in the school year for the value-added score, regardless of where they took the test in the prior year.
- Students who took the DLM either in the current Report Card year or the prior year are not included in the value-added calculations at this time.

How do value-added scores play out for schools with various grade ranges?
Value-added calculations are complex. To help clarify, below are a few case types that may help illustrate how the calculations work.

1. *K-3 schools*: Schools that only serve students in kindergarten through grade 3 will not receive a value-added score, as students only begin to participate in state assessments in grade 3. No prior-year test data are available against which to compare the performance of students in grade 3.
2. *Grade 5-8 schools*: All students who are school FAY and take the state assessment in a school serving grades 5 through 8 are included in that school's value-added calculation. The prior-year comparison scores for grade 5 students come from grade 4 at their previous school but are attributed to the school in which they were FAY for grade 5.
3. *Grade 9-12 high schools*: High schools with only grades 9 through 12 will not have a value-added score because there are no consecutive grades in which students take a state assessment used for accountability purposes (only 11th graders take the ACT).
4. *District FAY vs. school FAY*: Students who are not FAY at any one school but who are FAY in the district are included in calculating the district's value-added score.

Is DPI considering adding ACT Aspire results to value-added calculations in the future?

Yes. DPI staff are working through technical details to include ACT Aspire results in the report cards for next year, the 2018-19 report cards would be the earliest. Aspire results will be incorporated into Student Achievement, School Growth and the Closing Gaps priority areas.

Why doesn't my school or district have a Growth score?

There are two primary reasons why your school or district would not have a value-added score and thus no Growth Priority Area score:

1. There are no test score data available for students in your school from the prior year. This is true of any high school serving grades 9 through12, because the only state assessment currently used for accountability purposes is the ACT in grade 11. It is also true of K-3 schools, since, in such schools, only grade 3 students take state assessments and have no prior test data available for previous grades.
2. The number of students that could be included in value-added calculations at your school is less than DPI's minimum group size requirement of 20 for inclusion in the report cards.

Keep in mind it doesn't hurt your overall Report Card score if you don't have a Growth score. In such cases, the existing Priority Area scores are weighted to account for the lack of a Growth score, which is not assigned a weight. To get some idea of how your school or district is performing over time, you can look at the Closing Gaps Priority Area, though this compares one cohort of students to the next rather than reflecting growth of any one cohort over time. We also encourage you to utilize your local assessments to measure growth.

Where can I find more information on value-added?

For more information, contact Education Analytics and check out the Value-Added Research Center at the Wisconsin Center for Education Research, which has a long history of working with educators in Wisconsin and around the nation. They have a number of valuable resources to help educators understand value-added growth models:

- VARC Tutorials
  http://varc.wceruw.org/tutorials/
- VARC Professional Development
  http://varc.wceruw.org/what-we-do/professional-development.aspx

The resources provided above can be used to build a general understanding of what value-added is and how it works. However, these resources are not specific to the Accountability Report Cards. For specifics on the calculations used in the Accountability Report Cards, please refer to the Value-Added Technical Report (http://dpi.wi.gov/accountability/resources).