

What is IVA?

Measuring a teacher's impact on student learning can be challenging. After all, students start the year at different skill levels, and they all face different factors inside and outside the classroom that affect how they learn. At its core, IVA is a way of dealing with these challenges. It helps us estimate the teacher's impact on student learning as opposed to the impact of other factors, such as students' prior skill level, the resources they have at home, any learning disabilities they may have, or their classroom composition. In short, IVA helps us understand what the teacher did, apart from everything else.

How does it work?

First, we calculate how a teacher's students are likely to perform, on average, on our standardized assessment (the DC CAS) given their previous year's scores and other relevant information. We then compare that likely score with the students' actual average score. Teachers with above-average IVA scores are those whose students' actual performance exceeds their likely performance. This process is explained in further detail on the following pages.

Who calculates IVA scores?

DCPS has contracted with Mathematica Policy Research, a nationally respected research firm, to conduct research on value-added methods, provide technical assistance to DCPS, and calculate value-added scores for teachers based on specifications determined by the District of Columbia Office of the State Superintendent of Education (OSSE). Mathematica's clients have included the U.S. Department of Education and many other federal, state, and local agencies. In addition, independent value-added experts reviewed the methodology used to evaluate DCPS teachers, including Eric Hanushek of the Hoover Institution at Stanford University, Jonah Rockoff of Columbia Business School, and Tim Sass of Georgia State University.

Which DCPS teachers have value-added data as part of their annual IMPACT evaluations?

Individual Value-Added (IVA) applies to ELA teachers in grades four through ten, and to math teachers in grades four through eight. IVA is restricted to these grades and subjects because they are the only ones for which we have student DC CAS scores from both the prior and current year, a requirement for value-added.

How are DC CAS scores used in calculating IVA?

Scores on our state assessment, the DC CAS, are reported on a 100-point scale. For example, fifth graders receive a score from 500 to 599. Similarly, sixth graders receive a score from 600 to 699. It is important to note that the hundreds digit of these scores is for naming purposes only. That is, the "5" in a score of 574 tells us that this is a fifth grade score. There is no other meaning to the hundreds digit. The remaining two digits (in this example, 74) explain the student's performance. Mathematica uses the last two digits of the scale score to calculate IVA.

The proficiency levels on the DC CAS — Advanced, Proficient, Basic, and Below Basic — are created from the scale scores. For example, in 2012, any fifth grade math student who had a scale score from 60 to 74 was considered "Proficient." The proficiency levels are not used for the IVA calculation. Rather, as noted above, Mathematica uses the underlying scale scores. Doing so allows teachers to receive credit for their students' achievement whether or not their students move between proficiency levels from one year to the next.

Why do we use the DC CAS for IVA?

The DC CAS is the only assessment used in DCPS that is: 1) aligned to the DC content standards; 2) administered securely; and 3) standardized, meaning it is the same for all students in a given grade level. Though these tests do not capture everything taught in DCPS schools, they are reliable and valid measures of students' mastery of essential reading and math skills.

Is IVA the same as Adequate Yearly Progress (AYP)?

No. AYP only measures the percentage of students who score Proficient or Advanced on the DC CAS at the end of the year. It doesn't take into account where students start the year. It also doesn't take into account external factors that may affect student learning. IVA, on the other hand, does.

Do school systems in other states use value-added measures?

Yes. Many school systems — including those in Chicago, Milwaukee, Minneapolis, New York City, and Pittsburgh — either already use value-added measures or are developing them.

How is IVA calculated in DCPS?

The following five-step description provides an overview of how IVA scores are calculated.

Step 1: Teachers confirm their student rosters.

Each year, teachers who may be eligible to receive value-added scores participate in a process called Roster Confirmation, through which they indicate which subject(s) they taught, which students they taught within each subject, and how much time they spent with each student.

The Roster Confirmation process allows teachers to note special circumstances that might not be apparent if we simply used the class rosters in our student information systems to determine which students to include in a teacher's IVA calculation. For example, it allows a teacher to note if a student transferred into or out of her or his class midway through the year. It also allows a teacher to note if a particular student is pulled out of class on a regular basis for special education services or other reasons. With this information, we are able to give teachers credit for the achievement of their students in proportion to the amount of time they spent instructing those students.

Step 2: Based on specifications determined by OSSE, statisticians at Mathematica calculate the average likely DC CAS score for each teacher's students.

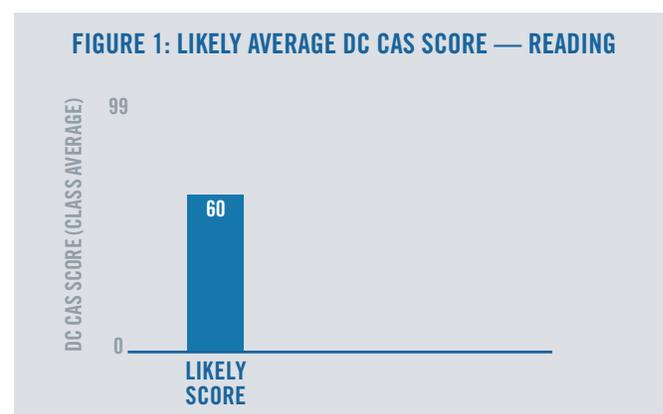
At the end of the year, after the DC CAS tests have been scored, statisticians at Mathematica calculate the teacher's average *likely* DC CAS score by analyzing the performance of students across DC. For example, if a student received a score of 20 on last year's DC CAS, this student is likely to perform about as well as other students in the same grade who received a 20 last year. When determining a likely score for each student, Mathematica accounts for the student's:

- DC CAS score from the previous year in reading and math;
- Eligibility for free lunch;
- Eligibility for reduced-price lunch;
- Special education status;
- Limited English proficiency status;
- Whether the student transferred across schools midyear; and
- Attendance from the previous year.

Mathematica also measures how a student's classmates may influence her or his achievement by accounting for the following class characteristics:

- Class's average test score from the previous year; and
- Extent of the variation in the students' scores from the previous year.

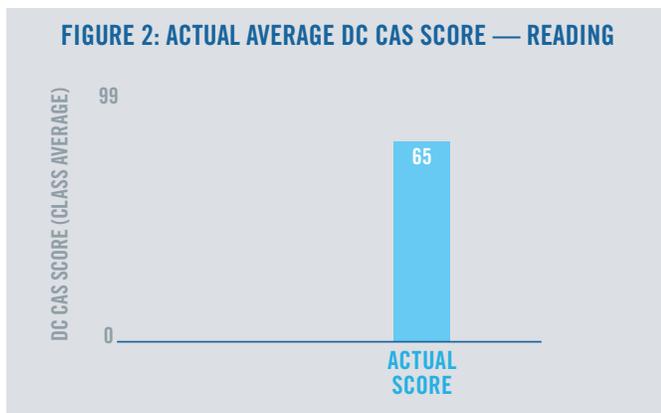
Figure 1 shows the average *likely* score for the students of a hypothetical reading teacher.



Step 3: Statisticians calculate the average actual DC CAS score for each teacher’s students.

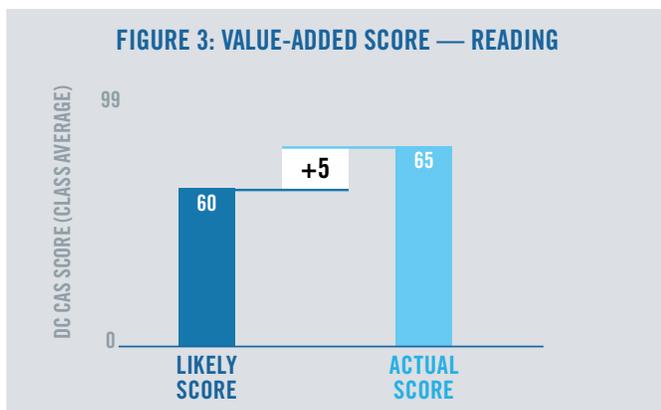
This step is accomplished by averaging the actual scores of all of the students in a teacher’s class at the end of the year, with each student weighted according to the amount of instructional time spent in the teacher’s class. For example, a student who spent half the year with a teacher would have her or his test score weighted at half that of a full-time student.

In Figure 2 below, the *actual* class average for our hypothetical teacher is 65.



Step 4: The average likely score is then subtracted from the average actual score.

The difference between how students actually perform and how they were likely to perform is the teacher’s “value-added.” Figure 3 shows this comparison for our hypothetical teacher. The students in this class have an average *actual* score of 65, which exceeds the average *likely* score of 60 by 5 points. Thus, this teacher has an IVA score of +5 ($65 - 60 = +5$). *In other words, having this particular teacher, as opposed to the average DC teacher, translates into five more DC CAS scale score points for the students in this class.*



Step 5: Based on specifications determined by DCPS, statisticians convert the raw IVA score into an IMPACT score.

The raw IVA score (+5 in the example to the left) is then converted into an IMPACT score on the 1 to 4 scale we use for all the other IMPACT components. If the teacher is responsible for both reading and math instruction, the two IVA scores are averaged together.

Can a teacher do these calculations on her or his own?

Unfortunately, no. Calculating a likely score involves a complex statistical process known as regression analysis. In addition, developing these scores requires one to have data about how *all* students performed on the DC CAS. Similarly, calculating an actual score involves additional information, such as how much time each student spent in a particular class. Including all of these data points helps us more accurately describe a teacher’s impact on student achievement.

Can a teacher receive a high IVA score if her or his students start the year at a very low skill level?

Yes. IVA takes into account the starting skill level of the students in a teacher’s class(es). As Figures 4 and 5 demonstrate, two teachers can have the same IVA score even if their students start the year at different levels. The average likely DC CAS score of the students of the teacher represented by Figure 4 is 45, while the average likely score of the students of the teacher in Figure 5 is 60. Both teachers, however, would receive the same IVA score (+5).

FIGURE 4: VALUE-ADDED SCORE — READING

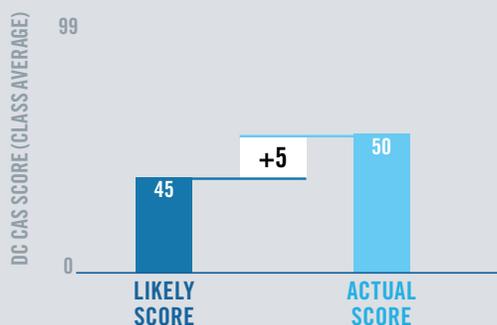
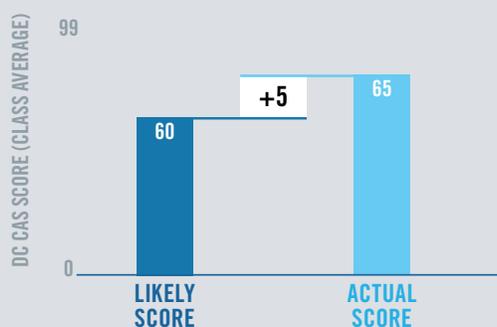


FIGURE 5: VALUE-ADDED SCORE — READING



Can a teacher receive a high IVA score if many of her or his students have IEPs or are classified as Limited English Proficient?

Yes. Statisticians account for these factors (and the others described above) when calculating the *likely* DC CAS score for a teacher's students. What matters is the extent to which the students exceed their likely score.

Can a teacher receive a high IVA score if several students transferred into or out of her or his class in the middle of the year?

Yes. As noted above, the Roster Confirmation process allows each teacher to note when students transfer into or out of her or his class. Each student contributes proportionally according to the amount of instructional time spent in a teacher's class.

Can a teacher receive a high IVA score if several students are pulled out for special education or other services during some part of the time they're assigned to that teacher?

Yes. The Roster Confirmation process allows a teacher to note if a student is pulled out of class on a regular basis for special education services or for other reasons. These cases are taken into account when determining the proportion of time each student spent with a teacher and, thus, the weight of each student's score.

Does a teacher need to have a minimum number of students to receive an IVA score?

Yes. The District of Columbia Office of the State Superintendent of Education (OSSE) requires that teachers have at least 15 students with DC CAS scores from the previous year and the current year in order to receive an IVA score. Having this minimum helps to discount the effect of unexpected occurrences during the testing period. For example, a student might have a disruption at home the night before the test that affects her or his test score and thereby distorts her or his teacher's IVA score. The effect of such an incident on a teacher's IVA score is likely to be greatest for teachers with few students, so no teacher receives an IVA score who has fewer than 15 students.

If I have additional questions about IVA, whom should I contact?

Please contact the IMPACT team at 202-719-6553 or impactdcps@dc.gov.