Taking a Data-Driven Approach to Expanding Eighth-Grade Algebra Participation

Industry

Education

Business Issue

Better identify students that should take higher level courses.

Solution

SAS® EVAAS for K-12®

Benefits

The school has tripled the number of students taking eighth-grade algebra, while maintaining a 97 percent passing rate on the state Algebra I exam.

Wake Forest-Rolesville (WFR) Middle School tripled the number of eighth-graders taking algebra, while maintaining a 97 percent passing rate on the North Carolina Algebra I exam. WFR Middle School used SAS® EVAAS® (Educational Value-Added Assessment System) for K-12 to identify students with a high probability of succeeding in algebra – even if they've never taken pre-algebra.

Former Principal Elaine Hanzer remembers the first time she saw the list of students that EVAAS suggested would be good candidates for eighth-grade algebra at the school (north of Raleigh, NC). At the top of the list was a student she knew personally – and not because he was a stellar student. He had been in her office for other reasons, had not taken pre-algebra, and was not recommended by teachers for higher-level math classes. "At first, I could hardly believe what I was seeing," says Hanzer, who just retired as Principal at WFR. "And then a realization set in; that child was me." Back in high school, Hanzer had to convince a high school guidance counselor that she was capable of taking the classes necessary to attend college – after years of being tracked into non-college prep classes.

EVAAS evaluates several years of end-of-grade testing to predict a student's ability to study higher-level subjects. Available to all North Carolina schools, it is widely used to place students in eighth-grade algebra. Taking algebra in eighth grade is considered a key stepping stone that allows students to progress to calculus by 12th grade. Students who take calculus in high school have a greater chance of successfully finishing a four-year college degree - particularly if they want to major in a STEM (science, technology, engineering or math) field.

Reducing the role of recommendations

Before using EVAAS to help select algebra students, WFR did what the majority of schools still do – relied on teacher recommendations. The first recommendation came in fifth grade when elementary school teachers suggest the advanced or regular math track. "But the recommendations come in the spring before the end-of-grade tests," notes Patches Jacobs, one of WFR's assistant principals. In addition, teachers routinely weeded out any pre-algebra students they didn't think could handle algebra.

The EVAAS recommendations caused some consternation, Hanzer notes, but it also led to soul searching – and some digging through the grade books. What the WFR math teachers discovered is that many of the students not recommended for advanced math were doing very well on class tests – but they were getting average to poor grades for other reasons, such as not turning in homework.

To test the EVAAS recommendations, Hanzer first encouraged teachers to put all the pre-algebra students that had a high probability of succeeding (as measured by EVAAS) into algebra. Then she recruited one teacher to teach a class

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of students who hadn't taken pre-algebra, but were recommended through EVAAS. The teacher offered extra help to catch the students up. The administrators said the students struggled at first, but as the year went on that class got better and better. Some even exceeded the scores of the students who took pre-algebra. In particular, that one student that caught Hanzer's eye did exceptionally well. At the end of the first year, every student passed the statewide algebra test – except the one student not recommended by EVAAS. "That student had been recommended by a teacher.''

Expanding the use of SAS® EVAAS® for K-12

That first year, Hanzer took a conservative approach, bringing in the 50 students with an 80 percent probability of passing the class. Her team met extensively with students, parents and teachers to explain the program and the reasons for placing students in algebra. Meanwhile, Hanzer and Jacobs began laying the groundwork to get more students into advanced sixth grade math and pre-algebra in seventh grade.

In the second year, the school placed all students with a 70 percent probability of succeeding at algebra (170) into the class. This group represents nearly half the eighth grade at a school where slightly more than 50 percent of the students are considered economically disadvantaged. EVAAS recommends educators use the 70 percent threshold; the passing rate that year was 97 percent.

Hanzer says there has been a "culture change" at WFR that turns conventional education wisdom on its head. Maintaining a class notebook, turning in homework, class participation, organization, neatness and projects are de-emphasized in grading and recommendations. Teachers can no longer dock students for putting their name in the wrong corner of a paper, "or not folding it a certain way,'' says Hanzer, who found these grading practices disproportionately affected poorer students who have less support at home. Instead, as she learned with the algebra placements, challenging students and telling them they can handle advanced subject matter has a positive impact on work habits. "Those habits changed as the second semester rolled in,'' Hanzer says.

As the school increases the pipeline into pre-algebra, it expects more students to take algebra this coming year. But WFR's success has not been enthusiastically embraced by all of Hanzer's peers. When she talks to middle school principals, "They tell me they are taking a risk. When I ask why, they say 'because you are overriding what a teacher has learned about a student throughout the year.'" So Hanzer shares with them that her teachers embrace the data-driven approach and have agreed together to drop homework down to the lowest percentage in assigning grades. "It's harsh to say, but teachers have prejudices, it (EVAAS) takes those out and you start dealing with fact; you know what a student is capable of.''

Next Steps

Confident that EVAAS can help the school identify the right math class for students, WFR is now looking to identify sixth-graders capable of taking algebra in seventh grade and offering them geometry in eighth grade. She also counsels peers to be careful about placements where data is missing – for instance with a student who has moved from out of state. "The 70 percent cutoff is now mandated in our district, but we still look at every single student,'' Hanzer says.

And while Hanzer is retiring, she is considering taking up an offer to serve on a district task force for educating economically disadvantaged students. "That population has probably benefited the most from this data.''