Guest essay: How the right approach to math can reduce the achievement gap

Ted Nutting Updated April 20, 2018 at 10:12 am

A longtime advanced-math teacher at Ballard High School says there's a simple way to improve math performance among all students and narrow achievement gaps at the same time.

Editor's note: This is the second of two essays we've published this month about math education. If you have a story you'd like to share about education, you can read more about how to submit a guest essay for Education Lab here.

In mathematics, American students do poorly by international comparison. This has been true for decades, and it is due in large part to the weakness of math instruction here.

If Seattle Public Schools ever hopes to eliminate its gaps in achievement between students of different racial backgrounds, it must address that problem.

I taught math in the Seattle schools for almost two decades. In my experience, what works is explicit instruction. That means explaining concepts in a clear, straightforward way, showing each student how to use them and following up with lots of practice – including rigorous tests.

Some may find this method old fashioned. But you can see explicit instruction at work in three Seattle middle schools where the achievement gap is shrinking. Mercer International, Aki Kurose, and David T. Denny International — where students of color are the majority — post solid math scores and are narrowing the achievement gap much more than other

schools.

A study, “Middle Schools that Narrow the Opportunity Gap in Math,” prepared last year by district staffers Anna Box and Marni Campbell, points this out. Seventh graders at each of these schools have shown continued progress on the state test, sometimes surpassing citywide proficiency rates. Until recently, all three schools scored well below the city average.

But to use explicit instruction, teachers had to set aside district-approved textbooks and materials because Seattle Public Schools – along with many other districts – favors an “inquiry-based” or “discovery” method for teaching math. For example: the teacher poses a question and becomes a “guide on the side” as students attempt to understand math concepts by working in groups. Afterward, they are asked to write journal entries about their discoveries. And when students actually compute, they often rely on calculators rather than pencil and paper.

For most, that is not the best way to learn math. Stumbling around trying to “discover” concepts takes too long, and sometimes the most advanced student in a group will get it, while leaving behind others who neither understand nor have practiced the skills necessary for finding the correct answer.

It is true that explicit instruction can result in students being able to perform calculations while not entirely understanding the concepts at work. That can come later. It’s better to be able to do the computations with partial understanding than to have neither the understanding, nor the skills.

Explicit instruction is particularly important for struggling students — regardless of grade level. Having the basics explained with lots of time for practice is much more effective than exploring on one’s own some concept that is very difficult to “discover” when one does not have command of the basic ideas needed to discover it.

And there’s lots of proof that it works beyond middle school. In recent years,

Seattle Times articles on efforts to close the achievement gap have featured Gildo Rey Elementary in Auburn and Foster High in Tukwila. Both schools have racially diverse student populations, and both have been using explicit instruction to increase math achievement.

At Ballard High, where I used the same method to teach AP Calculus, my students scored the highest in the district on Advanced Placement exams each year from 2008 to 2014, and virtually all of them took the test. In 2011-'12 the only school year when I taught a course with a state test required for graduation, my students scored higher than those of any other teacher in the district. Former students of mine have worked in math-focused jobs at Boeing, Microsoft, Amazon and other demanding employers.

Seattle has hired a new superintendent. Now is the time to sweep aside her predecessors' wishful thinking and encourage math teachers to use explicit instruction. Do this and watch the achievement gap shrink!

After 30 years in the U. S. Coast Guard, Ted Nutting earned his teaching credential and taught for 17 years at Ballard High School before retiring in 2014. He currently serves as a volunteer tutor for Rainier Scholars.