**Closing the Opportunity Gap in School Mathematics: Learning from Positive Outliers**

John Muir Elementary School, serving a high-poverty urban student population in San Francisco Unified School District, has closed the mathematics opportunity gap. How?

Figure 1 shows the SBAC scores by demographic subgroup at John Muir Elementary School. Muir serves a much higher proportion of English learners, students of color, low-SES students and housing-insecure students than SFUSD as a whole, yet shows higher mathematics SBAC scores than the district (which is shown by black lines).
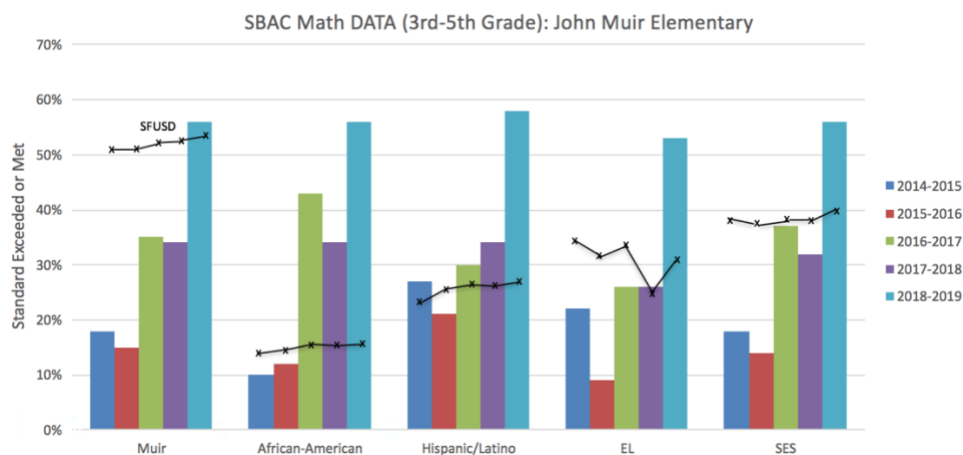
The teaching approach?
>   Teaching Through Problem-solving, which teachers began trying out in 2015-16

The teacher professional learning?
>   School-wide lesson study. In 2015-16, teachers began to expand lesson study from a single team to school-wide use, supported by the district's Teacher Leader Fellowship.

External support?
>   Mills College Lesson Study Group (www.lessonresearch.net) collaborated on school-wide lesson study and teaching through problem-solving, supported by funding from the Bill and Melinda Gates Foundation 2015-18.

The ask?
>   Teachers at Muir, and several other successful schoolwide lesson study sites, are eager to open up their work to educators at other sites. We seek funding to launch a network.

Both the overall low level of mathematics proficiency of U.S. students in international comparisons (OECD, 2020) and the substantial mathematics proficiency gaps by income and ethnicity within the U.S. (NAEP, 2019) are well known and have remained largely unchanged for more than a decade. Yet we have real examples, like Muir, serving low-income urban

neighborhoods in San Francisco, Chicago and Oakland, CA, where the opportunity gaps have been closed and the number of students meeting standards has doubled for the target groups. The improvement processes that drove these solutions continue; more gains are expected in future years.

Teaching Through Problem-solving is an approach in which *students*' build each new mathematical concept in the curriculum, by grappling individually with a challenging problem and then sharing and discussing solution strategies as a whole class.

Lesson Study is a teacher professional learning approach that has succeeded on very large scales in Japan and other Asian countries. It has been widely misunderstood in the U.S. as a model for writing and refining lessons; this is not what it is in Asia, nor at Muir. It is a system that builds teachers' collective efficacy as they study curriculum content together, design and test instructional improvements, observe lessons through the eyes of students, and connect their daily work to their shared long-term vision for their graduates. This is the lesson study we will implement and learn to scale in the U.S..

Why can't real success in a few places be extended to reach many more? We think it can. We seek funding to extend the network of schools—for the benefit of their students and to learn how to scale. We will support the new schools and study their adaptations, implementation hurdles and use of current resources. We will transform what we learn about scaling into tools and technology others can use to replicate the key drivers of improvement.

If you are interested in partnering with us to advance this project, please contact Catherine Lewis at Mills College (clewis@mills.edu) or see the work at www.lessonresearch.net

NAEP. (2019). *NAEP Report Card: 2019 NAEP Mathematics Assessment*. National Assessment of Educational Progress. https://www.nationsreportcard.gov/highlights/mathematics/2019/

OECD (2020), Mathematics performance (PISA) (indicator). https://data.oecd.org/pisa/mathematics-performance-pisa.htm doi: 10.1787/04711c74-en (Accessed on 01 December 2020)