

The Mathematics of Opportunity: **New Directions for Math in Educational Equity**

Opening up opportunity requires rethinking existing math practices and policies in K-12 and postsecondary education across four interconnected dimensions of math education. Within each, emerging practices suggest avenues for advancing equity that merit attention from the research and policy communities:

New Directions in Math Content. The Common Core State Standards embrace some new directions for high school mathematics:

- An **“integrated” curriculum** emphasizes connections between algebra and geometry content and is similar to the content in high-performing countries.
- **Statistics and probability** play a more central role, as does **mathematics modeling**, both of which are seen as supporting improved math learning.
- A set of **“mathematical practices”** detail the math literacy skills that students ideally should learn, regardless of specific content.

At least 20 state higher education systems have moved to a policy of offering **diversified math pathways**. They are expanding offerings such as statistics, quantitative reasoning, and mathematics modeling as general education courses. Examples include the **Carnegie Math Pathways**, **California Acceleration Project**, and the **Dana Center Math Pathway** model.

New Directions in Instruction. Examples of equity-focused pedagogy include:

The **Algebra Project** seeks to address disparities in math opportunities through a culturally-sensitive professional development program for teachers.

Mathematics for social justice courses approach mathematics as a tool for understanding and critiquing social issues, with an aim to provide a relevant context in which students can build math skills.

Social-emotional learning strategies use findings from learning science to support students in becoming resilient learners.

New Directions in Assessment. For admissions and placement purposes, many public colleges and universities are **de-emphasizing or eliminating standardized tests**, placing greater reliance on high school records, which are more valid predictors of college performance.

Other assessment approaches that are considered to support equity include:

- **performance assessments**, which aim to offer more authentic evaluation of student skills through research investigations, capstone projects, or open-ended real-world problems, and
- **formative assessments**, or low-stakes tests designed to offer feedback to students and instructors to inform their teaching and learning, rather than to penalize or rank them.

New Directions in Readiness Policies. In California, 2015 placement legislation was designed to make ninth grade math placement fairer and more transparent by requiring districts to use multiple measures of student performance and make placement policies more consistent.

San Francisco's school district pursued a delayed-acceleration policy—which delays Algebra 1 til ninth grade for all students— and experienced a dramatic reduction in the proportion of students repeating the course. The district instead offered several routes to accelerate during high school, and experienced an increase in the number of students on track to take AP courses as seniors.

Higher education institutions, including the University of California, also have begun sending the message to high schools that getting ahead in the traditional algebra-to-calculus sequence is not necessary for all students. For students who arrive in college, CSU pioneered an initiative in which students' 11th grade test results indicate their expected readiness for college-level math courses, with successful completion of an optional senior year readiness course guaranteeing placement in college-level math. Now, partnerships across the state are working to expand the range of senior-year math courses available to students, beyond traditional precalculus courses.

Postsecondary institutions increasingly are eliminating remedial math courses in favor of corequisite strategies, which place students into college-level courses and providing concurrent support to help students succeed in the course. They are also offering diversified math pathways to ensure that students gain a quantitative grounding that is aligned with their field of study.