

Inconsistent math curricula hurting US students, study finds

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A new study finds important differences in math curricula across U.S. states and school districts. The findings, published in the May issue of the *American Journal of Education*, suggest that many students across the country are placed at a disadvantage by less demanding curricula.

Researchers from Michigan State University and the University of Oklahoma used data from the 1999 Trends in International Mathematics and Science Study (TIMSS), which included 13 school districts and nine states in the U.S., as well as nearly 40 other nations.

"Overall, U.S. [students](#) are exposed to a less difficult school mathematics curriculum that places them at a disadvantage when compared to the students in many other countries of the world," write the researchers, led by William Schmidt of Michigan State. "Even sadder, a student's mathematics learning opportunities related to content coverage are deeply affected by where the student lives and in which of the 13 local school districts or nine states he or she attends school."

For example, algebra and geometry are generally taught in eighth grade by international standards. But U.S. states and school districts that participated in the TIMSS varied widely in the number of eighth graders whose [math classes](#) focus on those two subjects. In one district, 95 percent of eighth graders focus on algebra and geometry, but in another district, only 14 percent do. A broader look at the data shows the content differences between districts are as large as one grade level. In other words, topics covered in sixth grade in one district are not covered until

seventh grade in others.

The study found the variation in curriculum was correlated with students' overall eighth grade [math achievement](#), with students in the less demanding states and districts performing much worse than those in more demanding schools. This was true even after controlling for student background, including a measure of students' seventh grade achievement.

The less demanding curricula tended to be in districts that had large numbers of poor students. The mathematics taught in districts where over 70 percent of students were eligible for free or reduced-price lunch was about one-half of a grade level behind that of districts in which virtually no students were eligible.

However, the variation in content covered was not just a problem for poor districts. Even after controlling for socio-economic status, significant variation remained, suggesting that the problem is partly "a function of the very structure of the U.S. education system," according to the researchers.

"If these results hold more generally, the U.S. is not a country of educational equality, providing equal learning opportunities to all students," said Leland Cogan, an author of the study. "This is true not only for poor, minority, or disadvantaged students; any student can be disadvantaged simply due to differences in the rigor of the mathematics taught in the district in which they happen to attend school."

More information: William H. Schmidt, Leland S. Cogan, Richard T. Houang, and Curtis C. McKnight, "Content Coverage Differences across Districts/States: A Persisting Challenge for U.S. Education Policy." *American Journal of Education* 117:3 (May 2011).

Provided by University of Chicago

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