

What is the Equation for Algebra Education?

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Since the late 1980's social meliorists [have focused](#) on algebra for all students to address the unequal access that African Americans, Hispanics and lower SES students have to college. Their arguments were later bolstered by correlational [studies showing](#) that students who complete "early" algebra improved their math socialization and math achievement, were [more likely](#) to take advanced high school math courses and then [to apply](#) for college.

In California, these arguments and studies led legislators [to require](#) that all students take algebra in order to graduate from high school, the [California State Board of Education](#) (SBE) [to adopt](#) Algebra I as the recommended content standard for 8th grade mathematics and, as discussed in the Liang, Heckman and Abedi article, the California Department of Education [to penalize](#) schools when calculating their API score if students took the [General Mathematics CST](#) in the 8th or 9th grade.

However, in the Liang, et al, study, we find that as the percentage of 8th graders taking algebra has steadily risen, the unintended consequence of the 8th-grade algebra incentive policy likely results in less prepared students not passing the Algebra CST and subsequently repeating algebra. These results are consistent with the findings of other researchers: where universal algebra policies have been implemented, more recent evaluations have found troubling results. For example, in evaluating a North Carolina universal 8th grade algebra program, [Clotfelter, Ladd and Vigdor](#) found that early algebra students scored significantly lower on end-of-course algebra tests and were often less likely to pass subsequent Geometry and Algebra II courses on a college-preparatory timetable. Similarly, in an analysis of the Chicago Public Schools universal 9th grade algebra program, [Allensworth, Nomi, Montgomery, and Lee](#) found that more students received credits in algebra, but course failure rates increased, grades slightly declined, test scores did not improve and, most importantly, students were no more likely to enter college.

This begs several questions. Are aggressive or universal algebra placement policies good for all students? Can such policies be implemented in such a way that benefits all students? For example, some suggest that earlier preparation, [extra support, promoting a value of academic achievement, providing positive race/ethnic role models](#), and using innovative, experientially based pedagogy can make a difference. If so, how much of a difference and at what cost?

If not, how do we accommodate the math skills of less prepared 8th grade math students? What is the less-prepared student's best curricular option for academic success? Most importantly, what is the delicate balance between curricular rigidity and tracking students out of future opportunities? These questions should be addressed before fully implementing 8th grade math policy or we risk academically harming students while wasting enormous education resources.

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