

Study finds unintended consequences of raising state math, science graduation requirements

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Raising state-mandated math and science course graduation requirements (CGRs) may increase high school dropout rates without a meaningful effect on college enrollment or degree attainment, according to new research published in *Educational Researcher* (ER), a peer-reviewed journal of the American Educational Research Association.

"Intended and Unintended Effects of State-Mandated High School Science and Mathematics Course Graduation Requirements on Educational Attainment," by Andrew D. Plunk, William F. Tate, Laura J. Bierut, and Richard A. Grucza of Washington University in St. Louis, is the first study to examine the effects of state-mandated [math](#) and science CGRs together, and one of only a few that have looked at these policies more generally.

Overall, [high school](#) dropout rates increased as states mandated more math and science coursework, reaching 11.41 percent when students were required to take six math and science courses, compared to 8.6 percent for students without a requirement. Results also varied by gender, race, and ethnicity, with the dropout rate for some groups increasing by as much as 5 percentage points. (See Table 2 on page 7 of the full article for demographic breakdowns.)

"Our research suggests that many students were ill-prepared for the tougher standards, and ultimately failed to graduate," said William F.

Tate. "Going forward, state policymakers must understand that you can't do math and science courses if you are not in school."

For students exposed to higher math and science graduation requirements who do graduate, there was no across-the-board boost in [college enrollment](#) or degree attainment, at least in the short term.

While researchers did not find any overall association between higher CGRs and subsequent college enrollment and degree attainment, they did find some differences in subgroups based on sex and race/ethnicity.

Specifically, higher CGRs were associated with a decrease in the likelihood that black women and Hispanic men and women would enroll in college after graduating from high school. However, higher CGRs were associated with an increase in the likelihood that Hispanics and non-migrant black women who enrolled in college would earn a degree. (In this case, non-migrants refers to students who were born in the state in which they attended high school.)

To examine the effects of state-mandated CGRs on [educational attainment](#), researchers looked at student outcomes in 44 states where CGRs were mandated in the 1980s and 1990s, utilizing data from the U.S. Census, the National Center for Education Statistics, and the Education Commission of the States. The researchers used individual-level data to examine how factors such as sex, race/ethnicity, and interstate migration might influence how CGRs affect educational attainment.

"Policymakers must anticipate unintended consequences from more demanding content and more rigorous requirements," said Andrew D. Plunk. "We should also rethink what it means to be an at-risk student. To be effective, these measures will likely require academic and social support for a broad range of [students](#), as well as change at the K-8 level."

