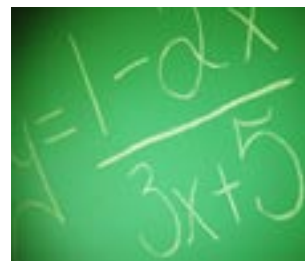




Examining the links between grade 12 mathematics coursework and mathematics remediation in Nevada public colleges and universities



Summary



Institute of Education Sciences

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Prepared by

Anthony B. Fong
WestEd

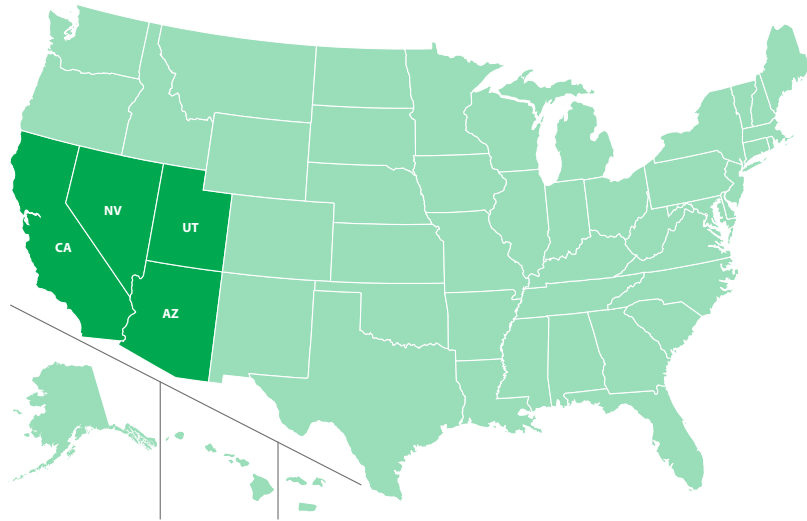
Min Huang
WestEd

Aditi M. Goel
WestEd



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Examining the links between grade 12 mathematics coursework and mathematics remediation in Nevada public colleges and universities

This study examines the links between Nevada’s grade 12 mathematics courses and remedial mathematics courses in Nevada’s public colleges and universities. It analyzes remediation rates by students’ highest grade 12 mathematics course level and mathematics grade point average and by various student and school characteristics.

This study of the links between Nevada’s grade 12 mathematics courses and college mathematics remediation in Nevada’s public colleges and universities was guided by four questions:

- Which mathematics courses did Nevada students complete in grade 12, and how well did they do?
- What were the remediation rates for each level of mathematics courses that students completed in grade 12, and how did the rates differ by student performance in those courses?
- How did the remediation rates differ by other student characteristics—race/ethnicity, gender, and type of public college attended (two-year, four-year, or combination)?

- How did the remediation rates differ by type of high school attended in grade 12, as measured by locale and by whether the school made adequate yearly progress that year under the No Child Left Behind Act of 2001?

The study calculated the college mathematics remediation rate of recent high school graduates in Nevada and disaggregated it by the highest level of mathematics courses completed during the students’ senior year in high school and by the combination of the highest level of mathematics courses taken and the students’ grade 12 mathematics grade point average (GPA), among other factors.

The analysis is based on the population of 4,653 students who graduated from a Nevada public high school in 2006 and enrolled in at least one mathematics course in a Nevada public college or university in the 2006/07 school year. Following the scheme developed by Burkam and Lee (2003), these students were sorted into eight categories based on the highest level of mathematics courses completed in grade 12, from No mathematics (students who did not enroll in any mathematics courses and students who enrolled but did not receive a passing grade in any mathematics courses) and Nonacademic (such

as consumer mathematics) and Low academic, through Middle I and II, to Advanced I–III.

The results show that whether students enroll in remedial mathematics as freshmen in college is related to the mathematics courses students completed in grade 12 and their performance in these courses. More specifically, the results show that:

- More than a third (37.6 percent) of students enrolled in remedial mathematics during their first year in higher education.
- Students who completed more advanced courses in grade 12 had lower rates of remediation, on average, than those who completed lower level courses. For the 495 students who had completed a Middle II course, 63.2 percent enrolled in a remedial mathematics course during their first year of college. For the 923 students who had taken the next higher level of mathematics (Advanced I), the rate was less than half that, at 31.5 percent. The remediation rate was halved again for the 708 students who had taken the next higher level of mathematics (Advanced II), at 15.4 percent, and it dropped to 2.7 percent for the 521 students who had completed the most advanced mathematics level (Advanced III). Completing higher level courses does not necessarily cause the lower remediation rates, however, and due to possible selection bias issues this analysis is unable to ascertain whether getting students to enroll in higher level courses would lower their mathematics remediation rates in college.
- Students' enrollment in remedial coursework was related not only to the level of mathematics courses they completed in grade 12, but also to how well they did in those courses. Among students who completed a given mathematics level in grade 12, those with higher grade 12 mathematics GPAs tended to have lower rates of remediation. In addition, students who did well in a particular course often had lower remediation rates than students who took the next level of mathematics but did poorly in the class. For instance, students who completed an Advanced I course and had an average GPA of 4.0 (A) in their grade 12 mathematics studies had a lower remediation rate than students who completed an Advanced II course but had a GPA of 2.0 (C).
- A logistic regression analysis revealed similar relations between remedial mathematics and the highest level of mathematics completed in grade 12. After gender, race/ethnicity, and grade 12 mathematics GPA are controlled for, the probability of enrolling in mathematics remediation is almost two and a half times greater for students completing Middle II mathematics courses than for students completing the next higher level (Advanced I). Predicted probabilities were also estimated from the logistic regression model and show, for example, a predicted probability of enrolling in mathematics remediation of 45 percent for White male students who completed a Middle I course in grade 12 with an average mathematics GPA of 2.7. The predicted probability is only 8 percent for the same group of students who completed Advanced II courses.

This analysis may be useful to several groups in Nevada. For the Nevada System of Higher

Education, which requested the analysis, this report quantifies the proportion of Nevada students who enroll in the state's public colleges and universities directly from high school and who enroll in mathematics remediation. It also provides information about the academic background of those students. This report may also help parents, students, and educators better understand the likelihood that students completing particular

mathematics courses in grade 12 will enroll in mathematics remediation before taking college-level mathematics courses. Finally, this study can serve as a starting point for discussions between K–12 and college administrators about what would be sufficient high school mathematics preparation for college-bound students.

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