

EDUCATION WEEK

Published Online: April 13, 2011

Updated: April 14, 2011

NAEP Study Finds Jump in Students Taking Tough Courses

By Caralee J. Adams

Students who take more rigorous courses in high school are more likely to perform well on achievement tests, according to a [study](#) released today that shows more students are doing just that.

The 2009 National Assessment of Educational Progress High School Transcript Study reveals that the percentage of high school graduates completing a “rigorous” curriculum, with higher-level mathematics and science curricula, jumped from 5 percent in 1990 to 13 percent in 2009. Those who took a “midlevel” curriculum increased from 26 percent to 46 percent in the same period.

In addition, the study found a link between students’ enrollment in challenging classes and their higher scores on the math and science NAEP in 12th grade. Because it is difficult to classify the rigor of English classes, compared with progression in science and math, the study did not look at the possible connection between English curriculum and NAEP reading scores.

The high school transcript study, which is conducted every four years, analyzed 37,700 transcripts from 610 public and 130 private schools from a nationally representative sample. Researchers looked at the link between coursetaking patterns and student achievement as measured by the national assessment, using a subsample of approximately 30,100 of the graduates who also took NAEP.

The report classifies student coursetaking by three curriculum levels: “standard” (at least four credits of English and three credits each in social studies, math, and science); midlevel (standard requirements plus geometry and Algebra 1 or 2; at least two courses from biology, chemistry, and physics; and at least one credit of a foreign language); and rigorous (all the midlevel requirements plus an additional credit in precalculus or higher math; courses in biology, chemistry, and physics; and at least three credits in a foreign language).

Although gaps between racial and ethnic groups persist, the study shows more minority students

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are taking higher-level courses since 1990. The proportion of black graduates attaining a rigorous-curriculum level increased from 2 percent in 1990 to 6 percent in 2009. For Hispanic students, the number rose from 2 percent to 8 percent in the same stretch, and for Asian/Pacific Islanders, it went from 13 percent to 29 percent. Whites, meanwhile, increased from 5 percent to 14 percent. Enrollment in rigorous courses for black and Hispanics students was virtually unchanged from the 2005 study to the 2009 report. At the same time, white enrollment grew from 11 percent to 14 percent, widening the gap.

"For years, we have sounded the alarm that all students need to be equipped with knowledge and skills to be successful," said Kati Haycock, the president of the Washington-based research and advocacy group Education Trust. "It appears that our students are getting that message, but this report is a sobering reminder of how much work needs to be done."

Ms. Haycock emphasized that while all groups are earning more credits, black and Hispanic students are still lagging behind whites in participation in higher levels of coursework and testing outcomes. "Far too many students, especially African-American and Latino, still do not have the kind of high school experience they need," she said, adding that there has been no improvement for those groups since 2005 in completing the more-rigorous coursework.

Quality of rigorous courses should be raised at schools serving people of color, Ms. Haycock said. "The idea we have to choose between access and excellence is dead wrong," she said. "Access and rigor should go hand in hand."

Somewhat surprising to researchers was the finding that even when students of color and girls take more rigorous courses, they do not perform equally high on the achievement tests, said Cornelia Orr, executive director of the **National Assessment Governing Board**, which sets policy for the NAEP.

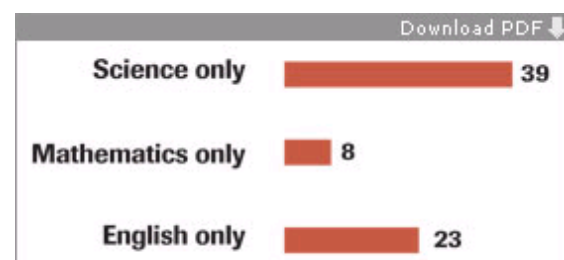
"It makes me want to question: Are the courses the same?" she said. "Perhaps the pace of instruction is different. There are any number of variables."

Of all students who took rigorous classes, Asian/Pacific Islanders scored 198 on the NAEP in math, whites scored 191, Hispanics 172, and blacks 167. In science, whites and Asian/Pacific Islanders both scored 186, Hispanics 164, and blacks 159. To be deemed "proficient," students had to score 175. Boys scored 192 on the math assessment, compared with 185 for girls; on science, the scores were 186 for boys and 177 for girls.

For students who didn't have enough challenging coursework to have it be considered rigorous, according to the study, science was the subject most often missing from the class lineup. That was a more common issue for girls: About 15 percent of girls, compared with 9 percent of boys, completing a midlevel curriculum did not have the science courses necessary to be considered taking a rigorous

Missing Requirements

Regardless of the curriculum path they were on—standard, midlevel, or rigorous—students were less likely to have taken the necessary science courses to reach the higher level.



SOURCE: National Center for Education Statistics

curriculum.

One possible policy implication is the need to counsel students to take more challenging classes earlier in their middle and high school careers so they have time to tackle more rigorous ones as juniors and seniors, Ms. Orr said.

Role of Algebra

Overall, high school students are racking up more classes. The average credits earned by graduates increased from 23.6 credits in 1990, to 26.8 credits in 2005, to 27.2 credits in 2009, the research found. Students find time to earn more credits by taking summer school, receiving high school credit for classes taken in middle school, and enrolling in online courses.

Graduates completing a rigorous curriculum had average NAEP scores deemed proficient, while graduates who completed a midlevel or standard curriculum had average NAEP scores that were considered “basic.”

Two-thirds of the graduates with a rigorous course load had taken Algebra 1 before high school—an 8 percentage-point increase since 2005. Those whose first high school math course was geometry scored 31 points higher on the math NAEP than graduates who started high school math in Algebra 1. The study also shows that 76 percent of graduates took Algebra 2 in 2009, compared with 53 percent in 1990.

Female graduates generally scored lower in math and science on NAEP than males completing the same curriculum. However, more girls took a midlevel or rigorous curriculum than in previous years. And while boys had grade point averages of 2.9 on average, female graduates earned 3.1 on average.

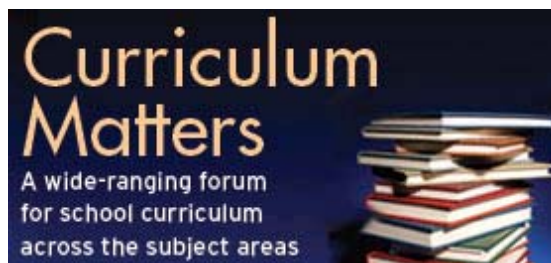
“These findings demonstrate a clear connection between course rigor and achievement, and they argue strongly for students to take a more challenging curriculum in our high schools,” David P. Driscoll, the chairman of NAGB, said in a press release. “Rigor in high school is closely linked to success afterwards, and this study confirms that we need higher secondary standards across the board. In particular, we need stronger requirements in math and science.”

Henry Kranendonk, a member of NAGB and a mathematics curriculum consultant for the Milwaukee school district, said the report underscores the importance of access to challenging math and science courses, delivered in an accurate and rigorous manner.

“A higher-level curriculum makes a difference, not just in students’ NAEP scores but also in the ability to handle challenging coursework and to be better prepared for life after high school,” he said in a statement.

“This further confirms that the common-core standards have arrived just in time,” said Bob Wise, a former governor of West Virginia and the president of the [Alliance for Excellent Education](#), a Washington-based education policy, research, and advocacy organization. “The common core

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raises the standards so, ideally, all students should be receiving a more rigorous curriculum.

"The study's results also come at a time when cutbacks are being made at the state level," he added. "At some point, you can't skimp on rigor. Rigor works, but you have to put it in effect. Rigor depends on resources."

Cliff Adelman, a senior associate at the Institute for Higher Education Policy, said the findings validate the theses of previous studies that content counts. "The academic intensity of one's high school curriculum is the highest-octane component of academic resources, far more important than grades or test scores," he said. "Take the courses, make the effort, and the test scores will follow."

Although the report's authors do not advocate any one course of study, NAGB is examining whether taking challenging coursework is essential to be better prepared regardless of whether students continue their education after high school or go into the workplace.

Vol. 30, Issue 28

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