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Online Algebra 1 Class Seen to Boost Skills and Access

By Sarah D. Sparks

With Algebra I often seen as a gateway course, online algebra classes can bridge the gap for rural students who are ready for advanced math but whose schools lack the resources for a formal class, according to the first federal longitudinal study of online algebra instruction.

The study, recently released by the Regional Educational Laboratory Northeast and Islands, finds that 8th-graders taking a virtual algebra course performed better in algebra testing and were nearly twice as likely to take rigorous math courses by 10th grade as students who only had access to general 8th-grade math.

"The equity issue is really core to the study," said Jessica B. Heppen, lead author of the study and principal research analyst at the Washington-based American Institutes for Research, which conducted the study with the Education Development Center Inc., of Waltham, Mass., for REL-NEI. "Students from these small rural middle schools don't necessarily go on to small high schools, but to big regional high schools where many of their peers had access to a face-to-face algebra course."

Researchers tracked the math performance and course-taking trends of 1,885 students from 68 overwhelmingly rural schools in Maine and Vermont. Each school identified students who were prepared to take algebra in 8th grade during the 2008-09 school year, and then those students were randomly assigned to either a Class.com online Algebra I class or to go through the normal hodgepodge of 8th grade math experience: a middle-school course including some algebra topics, dual-enrollment in a high school algebra class, or even reading an algebra book on their own at the back of the room.

The study found that algebra-ready 8th graders who participated in the online classes outperformed their peers in control schools on a 100-point test of algebra knowledge by 5.5 scale points, and 30 percent of students who took the virtual class scored above the midpoint of the test in algebra knowledge, compared with only 12 percent of students who took standard 8th-grade math.

That finding is even more significant, considering that only about half the students who took the somewhat student-paced online course were able to complete all nine content units, and that more than 90 percent of the standard 8th-grade math classes included algebra in at least half of their topics.

'Compelling Case'

The structure of the online course may have contributed to the students' algebra mastery, according to Peggy Clements, a study coauthor and an EDC research scientist. "We know students who took the online course had to complete every topic in every unit and take a quiz in order to move on. ... They couldn't skip anything," she said. While students in the regular class may also have been exposed to algebra topics,

she added, "we don't know in a face-to-face course if there is that same level of coverage."

Moreover, by the end of 9th grade, researchers found the students who had taken Algebra I online in 8th grade were nearly twice as likely to be taking a rigorous math track, including geometry and Algebra II by 10th grade. Students who had not had access to the online course, by contrast, were more likely to be doubling up on math classes in an attempt to catch up.

The study did not directly compare the effects of online with in-person algebra courses, but the findings highlight the potential of distance learning for students in any schools that cannot provide middle school algebra. That's a common problem for cash-and-staff-strapped rural schools: The study found 24 percent of rural schools nationwide do not offer Algebra I in grade 8, compared with 21 percent of urban schools and 9 percent of suburban schools.

"We know the critical importance of providing Algebra I to 8th graders who are ready to take the course," said Armando Vilaseca, Vermont's education commissioner and a member of REL-NEI's governing board, in a statement on the study. "The research makes a compelling case for extending access to an online version of Algebra I in schools that otherwise do not typically offer the course."

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