Cooperative learning methods top list of effective approaches for secondary mathematics

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Cooperative learning methods have been found to be most effective in raising the math scores of middle and high school students, according to a comprehensive research review by the Johns Hopkins University School of Education's Center for Research and Reform in Education.

Robert Slavin, director of the center, and Cynthia Lake, research scientist, reviewed 102 previously released experimental studies evaluating the effectiveness of math programs in the middle school grades. The review builds on their analysis of elementary math programs published in 2008.

The researchers' review covered three approaches to improving math achievement: textbooks, computer-assisted instruction and approaches emphasizing professional development in specific teaching methods, such as cooperative learning (in which students interact in teams) and teaching of learning skills.

Both the elementary math and the middle and high school math reviews found that the most effective programs focus on daily teaching practices. Two cooperative learning programs for middle and high school math—STAD (Student Teams-Achievement Divisions) and IMPROVE—showed the strongest evidence of effectiveness.

"The findings of this review suggest that educators as well as researchers

might do well to focus more on how the classroom is organized to maximize student engagement and motivation, rather than expecting that choosing one or another textbook by itself will move students forward," Slavin said. "Both the elementary review and the current review find that the programs that produce consistently positive effects on achievement are those that fundamentally change what students do every day in their core math classes."

Researchers conducted a broad literature search in order to locate every study comparing the effectiveness of various math programs to traditional control groups.

The results were published in the June 2009 issue of the American Educational Research Association's *Review of Educational Research*. The review notes that the three approaches to mathematics instruction do not conflict and may have added effects if used together.

The Johns Hopkins Center for Research and Reform in Education is conducting one of the largest research review projects ever undertaken to increase the use of evidence in education to improve student achievement. The intent is to place all types of programs on a common scale to provide educators with meaningful unbiased information that they can use to select programs and practices most likely to make a difference with their students. Topics include reading, math and other programs for grades K-12. Educator-friendly ratings of effective education programs as well as the full reports appear on the Best Evidence Encyclopedia Web site at www.bestevidence.org .

Provided by Johns Hopkins University (news : web)