Study: US needs better-trained math teachers to compete globally

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Math teachers in the United States need better training if the nation's K-12 students are going to compete globally, according to international research released today by a Michigan State University scholar.

William Schmidt, University Distinguished Professor of education, found that prospective U.S. elementary and middle-school math teachers are not as prepared as those from other countries. And this, combined with a weak U.S. math curriculum, produces similarly weak student achievement, he said.

The Teacher Education Study in Mathematics, or TEDS-M, is by far the largest of its kind, surveying more than 3,300 future teachers in the United States and 23,244 future teachers across 16 countries. Schmidt led the U.S. portion of the project.

"We must break the cycle in which we find ourselves," said Schmidt, who presented his findings at a Washington news conference.

"A weak K-12 mathematics curriculum in the U.S., taught by teachers with an inadequate mathematics background, produces high school graduates who are at a disadvantage. When some of these students become future teachers and are not given a strong background in mathematics during teacher preparation, the cycle continues."

More rigorous K-12 math standards, which are part of the Common Core State Standards Initiative, will be completed soon by the National

Governors Association and the Council of Chief State Officers. The standards are expected to be adopted by a majority of the 48 states considering them.

But the new standards will require U.S. math teachers to be even more knowledgeable, Schmidt said. His study found that while nearly all future middle-school teachers in the top-achieving countries took courses in linear algebra and basic calculus, only about half of U.S. future teachers took the fundamental courses.

To attack the problem, Schmidt laid out a three-fold approach:

- Recruit teachers with stronger math backgrounds.
- Implement more rigorous state certification requirements for math teachers.
- Require more demanding math courses in all teacher preparation programs.

Schmidt, who studied the performance of 81 public and private colleges and universities, said the real issue is how teachers are prepared - the courses they take and the experiences they have. The quality and type of programs in the United States varies widely by state and by institution.

TEDS-M revealed that differences in middle school teacher certification programs, for example, have a great impact on math-teaching capabilities. Future teachers prepared in programs focused on secondary schools (grades 6 and above) had significantly higher mathematics knowledge scores than those prepared in other types of programs, including those focused only on middle school teacher preparation.

"Teacher preparation curricula are critical, not only for our future teachers, but also for the children they will be teaching," Schmidt said. "The problem isn't simply the amount of formal math education our future teachers receive. It also involves studying the theoretical and practical aspects both of teaching mathematics and teaching in general."

Provided by Michigan State University