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Motivation, Study Habits—Not IQ—Determine Growth in Math Achievement

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Predicting Long-Term Growth in Students' Mathematics Achievement: The Unique Contributions of Motivation and Cognitive Strategies

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It's not how smart students are but how motivated they are and how they study that determines their growth in math achievement. That's the main finding of a new study that appears in the journal *Child Development*.

The study was conducted by researchers at the University of Munich and the University of Bielefeld.

"While intelligence as assessed by IQ tests is important in the early stages of developing mathematical competence, motivation and study skills play a more important role in students' subsequent growth," according to Kou Murayama, postdoctoral researcher of psychology at the University of California, Los Angeles (who was at the University of Munich when he led the study).

Murayama and colleagues looked at six annual waves of data from a German longitudinal study assessing math ability in 3,520 students in grades 5 to 10. They investigated how students' motivation, study skills, and intelligence jointly predicted long-term growth in their math achievement over five years.

Intelligence was strongly linked to students' math achievement, but only in the initial development of competence in the subject. Motivation and study skills turned out to be more important factors in terms of students' growth (their learning curve or ability to learn) in math. Students who felt competent; were intrinsically motivated; used skills like summarizing, explaining, and making connections to other materials; and avoided rote learning showed more growth in math achievement than those who didn't. In contrast, students' intelligence had no relation to growth in math achievement.

"Our study suggests that students' competencies to learn in math involve factors that can be nurtured by education," explained Murayama. "Educational programs focusing on students' motivation and study skills could be an important way to advance their competency in math as well as in other subjects."

Funding for the study came from the Alexander von Humboldt Foundation and the German Research Foundation.

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Summarized from *Child Development*, Volume 84, Issue 4, Predicting Long-Term Growth in Students' Mathematics Achievement: The Unique Contributions of Motivation and Cognitive Strategies by Murayama, K (University of California, Los Angeles, formerly at the University of Munich), Pekrun, R, and Lichtenfeld, S (University of Munich), and vom Hofe, R (University of Bielefeld).