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Math Education in the 21st Century: Using the methods of science to improve learning

Postsecondary math and science teaching have remained largely true to their medieval roots, while the disciplines themselves have advanced enormously. Modern society needs higher levels of general competence and specialized expertise in these fields. Research on how people develop expertise is providing new insights on how to provide more effective teaching. A number of teaching methods based on these insights have been tested in university classrooms. They have shown substantial improvements over the traditional lecture methods even as practiced by very good lecturers, particularly on measures that explicitly probe how well students are learning to reason like experts. I will discuss recent research on learning and these experiments demonstrating effective teaching methods.