

Building a better math teacher: Math professor considers new ways to use what we already know

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For years, it has been assumed that teachers -- specifically math teachers -- need to master the content they intend to teach. And the best way to do this is to take courses beyond that content.

Yet in a paper published today in the Education Forum of the journal *Science*, Dr. Brent Davis of the University of Calgary says research does not support this common belief. There is little evidence that advanced courses in mathematics contribute to more effective teaching.

"You know that feeling, when you try to explain to a child how to add multi-digit numbers, and you realize that it has become so obvious and sensible that you wondered why it ever seemed difficult?" asks Davis, a professor and Chair of [Mathematics Education](#) in the Faculty of Education.

"That's what you want to be an expert, and that's what you want to guard against to be an effective teacher. With years of practice and experience, it's easy to forget the difficulty involved for novices in coming to an understanding."

In his paper, "Mathematics Teachers' Subtle, Complex Disciplinary Knowledge," Davis argues that while recent studies stress the importance of teachers' explicit knowledge of mathematics course content, it is equally valuable for [math teachers](#) to be comfortable with the less clear,

or tacit, knowledge inherent in mathematics as well. The challenge, says Davis, is to find a way to identify that knowledge.

Davis uses the example of multiplication to illustrate how [teachers](#) can apply implicit knowledge by using different approaches to explain the subtleties of mathematics to their students. When introduced to multiplication, the straightforward concept of repeated addition becomes more confounding with the incorporation more complex applications, such as multiplying by fractions or multiplying by negative numbers.

Davis believes if teachers are able to develop a deeper understanding of [mathematics](#) with their students, however, it may prevent student frustration in later coursework and prepare them to contribute within a knowledge-based economy.

"We can build a better math teacher," says Davis. "But it's more about engaging with one another to deconstruct concepts than about learning more advanced math or engaging in problem solving."

Provided by University of Calgary

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