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Bridging Mathematics and Mathematics Education: Mathematics departments' contributions to the preparation of teachers

We value students who show a deeper understanding of the material—as well as facility at mathematical (and other) processes used by effective problem solvers. Mathematics departments can play a critical role in the preparation of teachers of mathematics who can support such learning, drawing on their own profound understanding of the basic mathematical material and flexible capacity with the processes. To achieve this, we must offer courses and programs that develop this capacity of future teachers.

Noticing that the largest cohort of our mathematics majors plan to be teachers presents our departments with important opportunities and responsibilities to respond to this. Responding effectively relies on good liaison with Mathematics Educators, familiarity with the current research findings on Mathematics for Teaching, and respect for those who work as teachers of mathematics and who research on these issues.

Drawing on ongoing research on what features make a difference in to pre-service and in-service teachers of mathematics, as well as the evolution of programs for teachers at York University, and elsewhere, we present some key recommendations for us as a community of mathematicians. This includes some key courses which have been shown to correlate with these capacities, such as geometry and history of mathematics, as well as capstone courses which offer opportunities to draw together multiple representations and multiple approaches to core mathematical concepts. Perhaps the most controversial, is the hiring into mathematics departments of faculty who will develop programs and courses focused on the needs of future (and current) teachers of mathematics. The pleasant surprise is that such efforts impact all our programs and offer the opportunity for better preparation of all mathematics majors.