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Building Bridges: Foundations for the Mathematically Hesitant

The only prerequisite to learning should be willingness to learn.

In sports, arts, and even other STEM fields, it is accepted that despite difficulty, progress can be made with sufficient, sustained effort. Mathematics, on the other hand, has a peculiar reputation for being exclusively for those with some supposed innate talent; this is a systemic problem in education, and it has resulted in generations of students left behind.

The Academic Bridging Program at the University of Toronto provides the opportunity for mature students to try again — to complete prerequisites to start undergraduate studies with the Faculty of Arts and Science. Students come from a diverse range of backgrounds with different strengths and gaps in their education. The mathematics requirement is usually at best a roadblock to on the way to their program of choice. In some cases, they have an aversion to it from past academic trauma.

In this talk, I will discuss:

- Working with a class where some took math a year ago, and some may not have seen it in a decade: scaffolding and support vs engagement and extension.
- Building and optimizing a program that covers fractions to pre-calculus in one year.
- Learning mirroring the research process — properties are introduced through (curated) exploration. Students propose patterns.
- Rigour as a way to break through fear, not incite it — providing just enough of the "why" to have solid ground to stand on.
- Observations from the classroom over the past two years.