Mathematics Bridging at the University of Adelaide

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Outline

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- The "What", and the "Why" of my Research

A Brief Summary of Results
- Literature Review
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Recommendations & Conlusions

References

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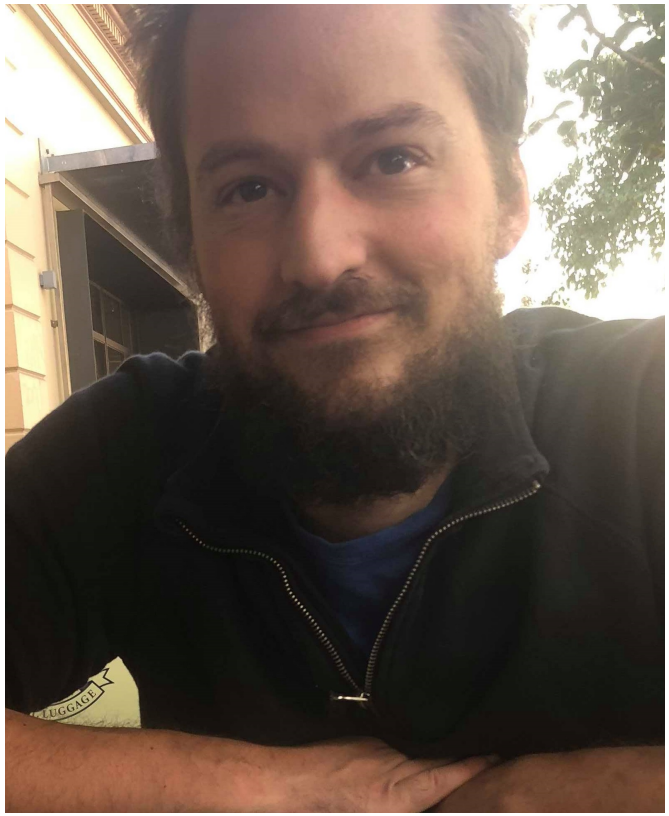
About Me

- Lyron Winderbaum
- Ph.D. in Mathematics
- Teaching at UofA since 2010.



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My Research Question

How can MathsTrack be improved?

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What is MathsTrack?

MathsTrack is a mathematics bridging course offered through the Maths Learning Centre (MLC) at the University of Adelaide (UofA).

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Mathematics Bridging

Mathematics bridging courses attempt to catch students that would otherwise "fall through the gaps" in our education system, providing them with a path towards a tertiary mathematics education that might otherwise be unavailable to them.
They serve a crucial stop-gap role in our education system and our society more broadly.

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The Mathematics Problem

Partitiicipation in mathematics education has been steadily declining for over three decades.
In the meantime, the Australian and international industries and economies have been becoming steadily more dependant on a mathematically educated workforce.

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Equity

The "Mathematics Problem" has two key consequences:

- Struggling economies due to reduces supply of capable workforce.
- Increased disadvantage in the job market for people without access to a mathematics education.

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Motivation

Mathematics bridging is serving an increasingly important role in our education systems worldwide and is getting increased attention due to it's importance to industry and impact on economies, but also it also serves a critically important role in our culture by offering the potential for social mobility.

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Introduction

I conducted two parallel avenues of research:

- A literature review, and
- A curriculum mapping,

finally making recommendations based on the synthesis of both.

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Summary

- Secondary-Tertiary Transition (Clark & Lovric, 2008)
- Maths Anxiety (Ramirez, Shaw, & Maloney, 2018)
- Negative Affect towards Maths more broadly (King & Cattlin, 2015)
- Self-Efficacy (Klinger, 2011)

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Take-Home Message

"... although attitudes and beliefs about mathematics are important for students enrolled in bridging programs, the programs can change students' attitudes and beliefs about mathematics as well as their achievement."

—Galligan and Taylor (2008)

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Content

So addressing students affect towards maths is crucial to their success. In addition to addressing students affect, we also need to give them the relevant knowledge and skills to be successful. That is the focos of the Curriculum Mapping — to put students leaving the bridging course on the same footing in terms of content knowledge and skills as students leaving highschool.

Relevant Curricula

The relevant curricula considered are:

- Australian Curriculum Senior Mathematical Methods and Specialist.
- SACE Stage 1 Mathematics and Stage 2 Mathematical Methods and Specialist.
- MathsStart and MathsTrack.

MathsStart and MathsTrack

In principle, the intention behind the bridging courses is for:

- MathsStart to take topics from highschool mathematics up to year 11 to prepare students for entry into MathsTrack, and for
- MathsTrack to cover year 12 Mathematical Methods.

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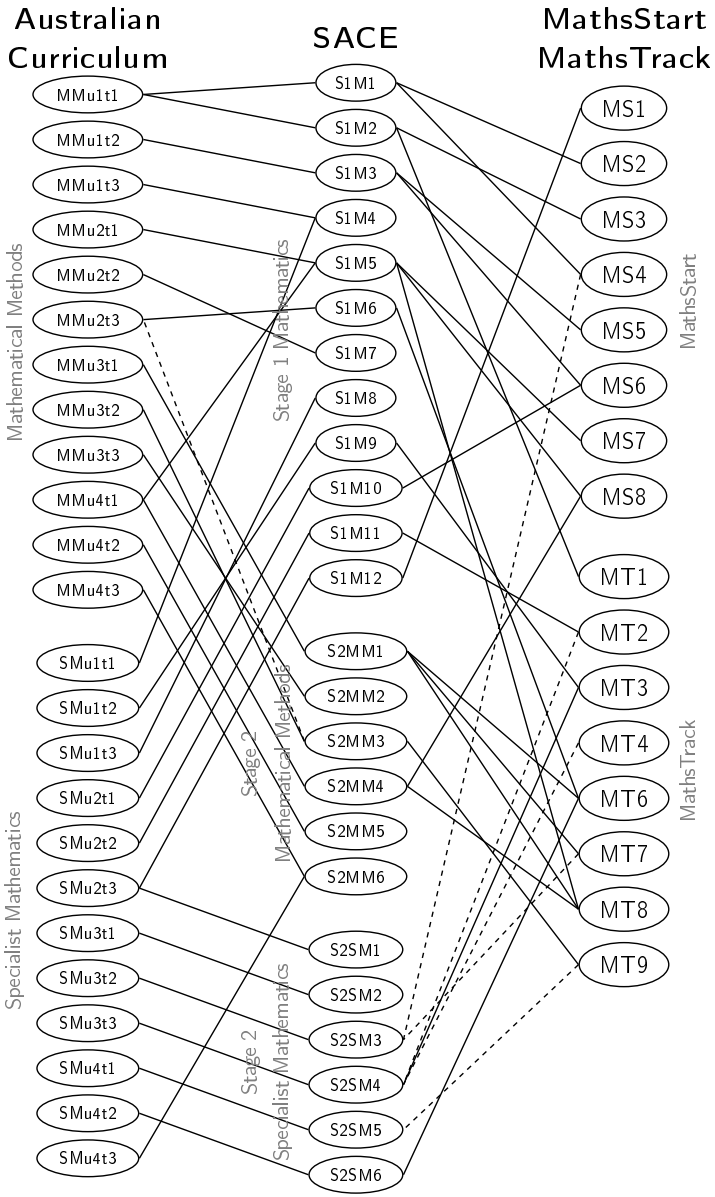

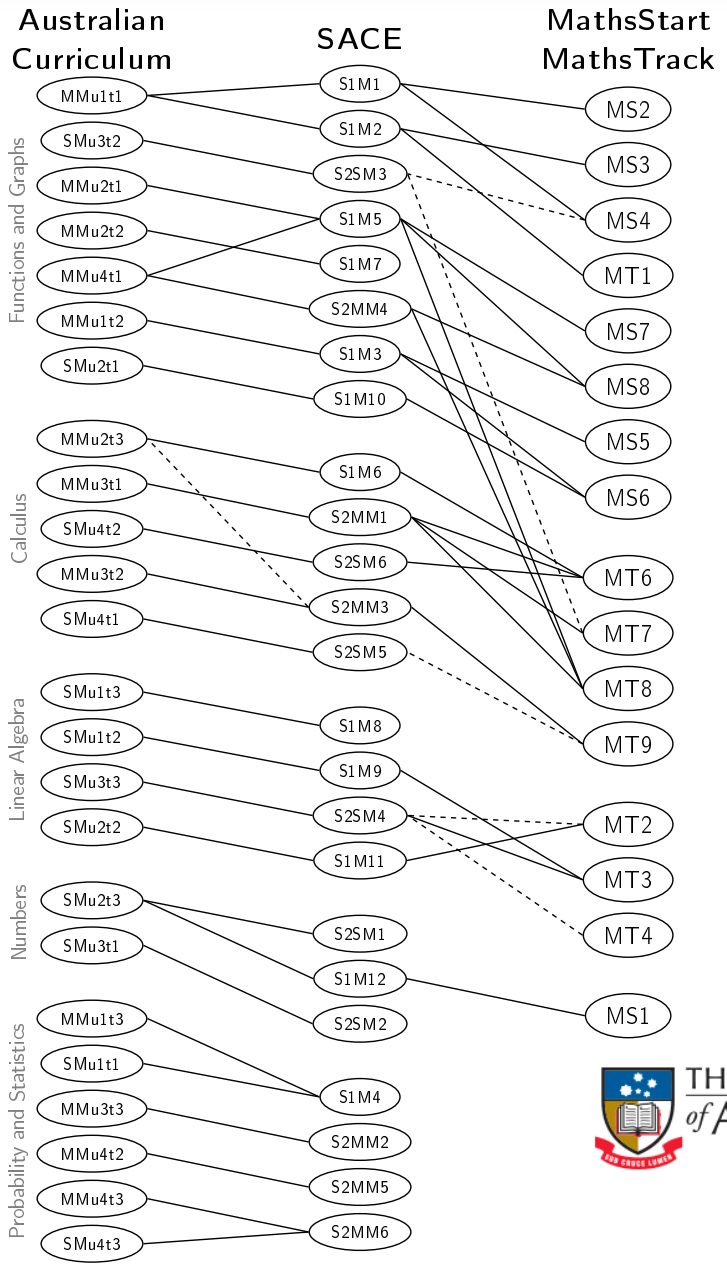

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Recommendations

- SET CLEAR EXPECTATIONS.
- Encourage Social Interaction Between Students.
- Adjust content to better align with the national curriculum but do so gradually, with a keen eye on students affective reactions to content as the priority.

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Impact & Conclusions

Bridging courses have the opportunity to:

- provide students with a path towards a mathematics education, and the social mobility that entails, that they might otherwise not have had access too.
- have an impact on students' affect towards mathematics, and hence also
- help students to succeed both in mathematics education and in life.

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APST

- 1.1: Physical, social and intellectual development and characteristics of students
- 1.2: Understand how students learn
- 2.1: Content and teaching strategies of the teaching area
- 2.2: Content selection and organisation
- 2.3: Curriculum, assessment and reporting
- 3.6: Evaluate and improve teaching programs
- 4.1: Support student participation
- 6.3: Engage with colleagues and improve practice

Questions?

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