Integrating Data Science, Computational Thinking, and AI into Mathematics Education: An Australian Challenge

Justine Sakurai
University of Melbourne
j.sakurai@unimelb.edu.au

Max Stephens
University of Melbourne
m.stephens@unimelb.edu.au

Rachael Whitney-Smith
ACARA
Rachael.Whitney-Smith@acara.edu.au

Merrilyn Goos
University of Queensland
m.goos@uq.edu.au

Elena Prieto-Rodriguez
University of Newcastle
elena.prieto@newcastle.edu.au

Chris De Haer
University of Western Australia
christopher.dehaer@uwa.edu.au

Overview

The Australian Curriculum Version 9.0 provides a context for integrating Data Science, Computational Thinking, and Artificial Intelligence into mathematics education. Data Science is emerging as a standalone subject, offering a pathway into statistical reasoning, modelling, and real-world problem solving in mathematics; however, awareness among mathematics teachers remains low and uptake is modest. Computational thinking is embedded across the curriculum as a core component of mathematical thinking, supporting abstraction, algorithmic reasoning, and investigation processes central to mathematics education. Artificial intelligence is rapidly evolving and potentially disruptive, creating new contexts in which mathematical ideas are applied, interpreted, and scrutinised. Together, these areas highlight how digitalisation is reshaping mathematics education. Increasing reports of AI disruption strengthen the case for critical data and AI literacy within mathematics, preparing students for adaptability, systemic understanding, and informed citizenship, and challenging educators to distinguish between foundational and genuinely new mathematics (NASEM, 2025).

Key Issues

- Visibility: Data Science exists as a subject, but how do we ensure students, teachers, and school leaders know about it and understand its value?
- Consistency: States and territories will implement these changes differently. What mechanisms support cross-jurisdictional learning without imposing uniformity?
- Teacher readiness: Most teachers of mathematics have had limited exposure to data science and AI. What professional learning is working, and what more is needed?
- Curriculum and assessment: Curriculum structures have not kept pace with these changes and risk falling short of educating young people for the world ahead of them.

Questions for Discussion

1. What is making computational thinking difficult to consistently implement?
2. What are structural barriers, beyond awareness, limiting uptake of Data Science?
3. How can curriculum and assessment practices respond to AI?
4. How can teachers design tasks where AI opens inquiry and support mathematical thinking?
5. How should MERGA respond, from a research and leadership perspective?

Australia has strong curriculum foundations to build from - an opportunity to examine what is working, and why AI requires rethinking about the teaching and learning of mathematics.

Reference

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