



The Wilkie Way

Newsletter February 2023

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Focus on Professional Learning for Teachers

Content for this newsletter has been taken from **Advice on refreshing the English-medium Mathematics and Statistics learning area of the New Zealand Curriculum**

Findings from the Expert Advisory Panel (September 2021)

Read the full article <https://www.royalsociety.org.nz/assets/Pangarau-Mathematics-and-Tauanga-Statistics-in-Aotearoa-New-Zealand-Digital.pdf>

Greater teacher content knowledge of mathematics and statistics for teaching positively impacts students learning. While there are a number of ways to conceptualise teacher knowledge for teaching mathematics and statistics, the common link is that more is needed than just being able to do the mathematics and statistics yourself.

There is strong evidence that initiatives that increase teacher knowledge of mathematics and statistics for teaching are very likely to improve outcomes for learners.

This includes:

- Understanding mathematics and statistics;
- Knowing the ways mathematics and statistics are commonly learned;
- What common mistakes and pitfalls are for learners;
- How best to represent and model ideas for learners;
- How to connect the mathematical and statistical ideas to learners worlds and motivations.

Findings: Knowledge of mathematics and statistics content in people who want to become teachers is highly variable. Evidence from entry into initial teacher education suggests that the majority of teacher candidates cannot answer questions appropriate for curriculum level 4. More recent research indicates a persistence of this problem, particularly in teaching 'mathematics for numeracy' in the New Zealand classroom. (Mills J.P. (2018) University of Waikato)

The lack of disciplinary knowledge poses a challenge for teacher preparation and ongoing professional learning. The magnitude of the difficulty, exacerbated by negative experiences and attitudes in some teacher candidates means that career long input may be needed to support teachers to provide sound mathematics and statistics education for students.

About half of teachers surveyed by the NMSSA in 2018 felt their professional support for teaching mathematics was good. This means that about half of the teachers thought their professional support was fair, poor or very poor.

Recommendations (There are a total of 14 recommendations)

9. Provide research and evidence based sustained professional learning on mathematics and statistics knowledge for teaching for all teachers of years 0 – 8 and non-specialist teachers in years 9 – 13 and consider compulsory mathematics and statistics professional learning in the induction period for provisionally registered teachers.

This professional learning should recognise the scale of learning and change required by committing to long term investment in people. *(CW There is no quick fix.)*

All year 0 – 8 teachers and non-specialist teachers of mathematics in years 9 – 13 need access to sustainable long term opportunities to increase their mathematics and statistics knowledge for teaching

and use it in practice. Likewise the whole preparation period for new teachers – (attaining a teaching qualification and the two year induction and mentoring while in a teaching role) should be considered for the development of mathematics and statistics knowledge for teaching. This should include initiatives for provisionally registered primary school teachers that are linked to classroom practice.

In the light of this compelling need to improve teachers mathematics and statistics knowledge for teaching the panel is deeply concerned that universities and other teacher education providers have cut back the mathematical provision in the Education degrees for teachers since 2005, by as much as 50%. This would seem to exacerbate the situation. The Panel suggests the Ministry of Education investigate why this has happened and the Teacher Council's role in facilitating it, and take steps to remediate the issue.

10. Provide research and evidence based professional learning for teachers in years 0 – 13 to support the use of inclusive, culturally sustaining pedagogies that communicate high expectations of learners and enable access for all.

Currently we know that opportunities to learn mathematics and statistics for our students are varied in nature and quality. For mathematics in particular, the numeracy development project promotion of 'ability' grouping/teaching has assisted deficit theorizing around school readiness and teacher expectations. It was promoted as a way to provide targeted support, ability grouping explicitly or implicitly created different levels of expectations for tasks and products for groups of students. The grouping by 'NDP stages' promoted teaching computation in lock step progressions, with children in lower stage groups receiving limited opportunities to progress or move out of these groupings. The diagnostic tools that were designed to inform teacher planning are instead more frequently used as a tool to label children; the viewpoint that "some students have more to contribute and are expected to contribute more than others while others are less capable and have less to contribute" became a self-fulfilling prophecy. In those classrooms that follow the NDP scripted lesson plans, a focus on isolated computational strategies limits students' opportunity to progress. As a consequence, rather than building computational fluency and confidence with early number work, these learners struggled to know which and when to apply strategies to solve number problems.

5. Cease use of within or across class ability grouping to ensure equitable learning opportunities for students and maximize the amount of quality teaching in primary and intermediate mathematics and statistical learning.

In class groupings of students with similar levels of attainment limits face to face teaching and increases workload on teachers through preparation. Further harmful effects include limited learning opportunities for high level mathematics for students placed in middle or low attainment groups, a disproportionate numbers of ethnically diverse or lower socioeconomic status students assigned to lower attainment groups, negative impact on self-confidence an learner identity, and a widening achievement gap.

A move to not using within class or across class ability grouping within primary schooling is a significant shift in practice, and there are many barriers to overcome in order to support effective teaching practices delivering more equitable outcomes, Addressing this recommendation will require specific support for teachers. A key step in this process will be the continued development of examples of exemplary practice, and the intensive professional learning required to support teachers to shift practice away from in class or across school attainment grouping.

MOE response: There is no specific funding for the provision of professional learning opportunities to support the curriculum refresh. The expectation is that professional learning will be led by the principals in each individual school. All schools should have received the document through the post **Leading mathematics teaching and learning in years 1 - 8 What principals need to know and be able to do** Available to download from:

<https://nzcurriculum.tki.org.nz/News/Leading-mathematics-teaching-and-learning-in-years-1-8>

Funding for professional learning support is via the contestable centralised funding application. There is no funding round in term 1.

My recommendation is to gather your evidence for making a funding application in term 2. The closing dates for applications is not yet available but is likely to be the 12 or 19 of May.

Please make mathematics a high priority, the situation for the future careers of our students depends on quality mathematics learning opportunities. Every job requires the facility to work with numbers.

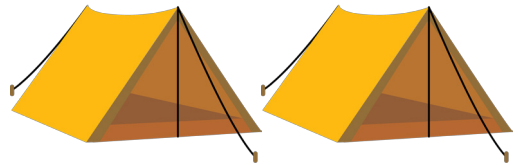


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Problems with Holidays

A family of 8 went camping. They took 2 big tents.

How many could sleep in each tent?



They stayed for 7 nights, and it was a different number in each of the tents every night. There was never an empty tent. Do you notice a pattern?

57 people went to the beach.
Only one third of the people went swimming.
How many people did NOT go swimming?



A family went to a theme park. They went on 8 different rides.
Each ride took 5 minutes and they had to queue for 20 minutes at each ride.
It was a 6 minute walk between rides. Including 6 minutes from the entrance to the first ride and 6 minutes to the exit from the last ride.
They had 30 minutes for their picnic.

If they arrived at the theme park at 9.30am, what is the earliest they could have left the theme park?



2292 passengers were on a cruise. All the passengers used the spa, the gym or the pools.

During the cruise twice as many passengers used the gym than used the spa.
Three times as many passengers used the swimming pools than used the spa.



How many passengers used the spa, used the gym or used the pools?