

The Impacts of the Numeracy Project on Teaching and Learning



Background and Introduction



The Numeracy Development Project (NDP) existed officially as a professional development programme for teachers in most primary schools in New Zealand between 2000 and 2009. It put more emphasis on teaching children a range of strategies for solving mathematics problems, with more emphasis on mental problem solving and less on written methods.

The main goal of the NDP was to improve student achievement in mathematics by upskilling the capability of their teachers. This resource asserts that an effective teacher of mathematics has a thorough and deep understanding of the subject matter, how students are likely to learn it and the difficulties and misunderstandings they are likely to encounter.

Key References

Ministry of Education. (2010). *Findings from the New Zealand Numeracy Development Projects 2009*. Wellington, New Zealand: Learning Media

Ministry of Education. (2007b). *The New Zealand Curriculum*. Wellington, New Zealand: Learning Media.

Patterson, R. (2015). *Un(accountable): Why Millions on Maths Returned Little*. Retrieved November 11, 2020, from The New Zealand Initiative Web site: <https://www.nzinitiative.org.nz/reports-and-media/reports/unaccountable-why-millions-on-maths-returned-little>



Objective



The overall purpose of the research conducted is to see how the implementation of this resource in schools has affected student outcomes by keeping these three questions in mind:

- Has the Numeracy Project indeed enhanced the teaching of mathematics?
- Do our teachers now have a deeper understanding of mathematical concepts and strategies in the early years?
- Can we go as far as to say that by raising teacher capability we have managed to improve student achievement and outcomes?

Questions such as these have been examined using literature from a variety of sources paired with the analysis of current assessment data of 32 Year 8 students attending a nearby NZ intermediate school.

Key Findings: Literature Review



Just like the New Zealand Curriculum, the Numeracy Project was originally established to help teachers, parents and students understand the requirements of the number strategy sections of learning mathematics.

However, the extra emphasis placed on number at times crowded out the other mathematics strands of algebra, geometry, measurement and statistics.

Furthermore, it was also found that the NDP strategies were taught as rote procedures and that students were required to know all the strategies required to solve one problem before moving on – two things that created confusion and misunderstanding amongst those that it sought to help.

This extra emphasis resulted in New Zealand placing 23rd in 2013 in an international student assessment when placed 13th only three years prior.

Key Findings: Analyses



A Year 8 class dataset was analysed using a variety of statistical methods. The data used in Figure 1 are called 'Pre-Tests' and there are four in total – each related to a mathematics area (bar statistics). These tests are marked out of 100 and are mainly used to identify gaps/strengths in students' mathematics knowledge. They are rarely used to inform marks found on report cards as they are conducted before any teaching has taken place.

The main findings after having run several analyses are highlighted in the boxplots below. There does not seem to be too much variation between math scores between the different mathematics strands. The median scores are all quite similar as are the distributions of the results. While algebra and measurement have a higher level of agreement with each other, any obvious differences in marks between the reference group number and the other strands are minimal.

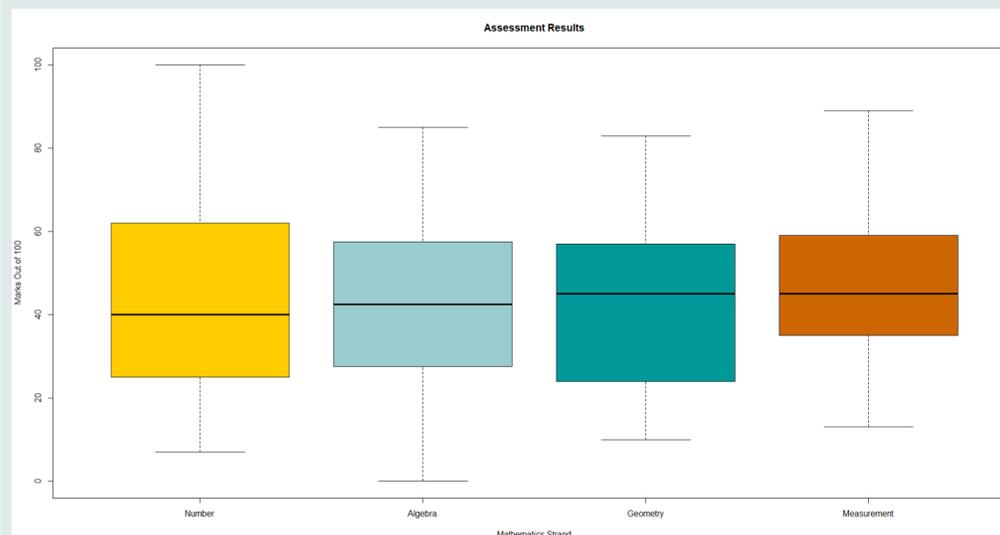


Figure 1

Results

While it was not the intention of the creators of the Numeracy Project that other mathematics strands be neglected, it seems as though that is what took place during the years of its implementation.

The literature reviewed in this project heavily criticized the extra emphasis of number in the classroom. From the dataset analysed, it seems as though some teachers have adjusted their teaching practice in response to this critique and are giving the rest of the mathematics strands a fair go now too.

