



# Pasifika Success: Teachers Developing Communities of Mathematical Inquiry

These days learning maths is more than just getting the answers correct. Students are being taught how to think about maths in a holistic way - and one that embraces Pasifika and Māori values.

At Auckland's Koru Primary School in Mangere, teachers are seeing high achievement levels in mathematics as a result of the 'Pasifika Success Maths' programme.

The programme, which was introduced into the school last year, was developed by Dr Roberta Hunter of Massey University and dubbed 'Bobbie Maths' by the staff and students. Her method works on a collaboration model, rather than students solving problems individually and being the first to raise their hands.

Dr Hunter says, "If children are given the right level of challenge, they will rise to it, and teachers must expect it. Students at

Koru School are actively engaged as they are taught how to think and argue in an appropriate way, how to explain their ideas, to ask questions, and justify their solutions."

It's an approach that stems from Dr Hunter's study 'Teachers Developing Communities of Mathematical Inquiry'. The study followed two teachers in low decile schools as they developed teaching practices that became highly effective for their Pasifika and Māori students. Key to these practices was creating peer environments where students felt encouraged to engage in constructive talk about maths. At Koru School students learn mathematical problems that incorporate

their culture, identity and language to create a deeper understanding.

"Pasifika people have their own maths and that is important," says Dr Hunter. "Lots of activities we do as Pasifika people involve mathematical concepts.

"I am a Cook Islander, but I grew up not knowing that my maths came from my Cook Islands background. My great great-grandfather was a navigator - that is mathematics - my mother makes tivaevae, they are not just stupid old quilts, they are something of cultural value, but wow the maths in that, the patterning and so on.

"Children can apply maths in home, too.



Look at some of the aspects of craft like tapa, look at the maths involved in that – the geometry and the measurements. Before it was something grandma did, but that is a respectful piece of maths.

“Children also need to keep going in maths to give them job options, so often they stop short because it’s too hard and their job opportunities disappear.”

11 year old Anaius Kato admits that while the problems are harder, he enjoys it. “It’s cool to share ideas and tell my friends how I worked it out.”

The questions are deliberately challenging. Anaius’s teacher George Tyrell says, “It’s about lifting their mathematical thinking. We’ve moved from ability group work to mixed ability groups where each group has an expert to initiate discussion. Having high order thinkers will stretch the others – like the Māori concept of the tuakana-teina relationship, where the older or stronger learner can help guide the younger or less experienced.”

George also suggests that “parents can get their children to calculate change, or work out discounts on sales, even explore math websites with fun activities as there

are a large number of appropriate websites that support learning in maths.”

Part of ‘Pasifika Success - Maths in communities’ involves observation days, when teachers record and view each other’s lessons which are then discussed and analysed together.

“It’s part of our professional development,” explains George. Dr Hunter says, “All of the teachers at Koru School have written problems that are appropriate for the children, and are about their lives. Children are looking and talking to each other about the maths. Mathematical problems that we thought Pasifika children wouldn’t do, they are doing it, and higher than expected.”

“That’s why these children are doing well in this school, because their teachers expect it, and we have to expect the most. But then we make sure that children pull on all their cultural values to work together. That is the concept of service, of reciprocity,” she says. “Core Pasifika values of the Pasifika Education Plan are being lived, and they are being lived around and within maths.

“Our Pasifika children here could teach the rest of New Zealand about how to work together, how to talk, how to support

each other, and how to value what really matters, [which is] not competition, but collaboration.” Anaius feels the same. “Sometimes when [the problem] is too hard for me and I don’t get it, other students will tell me how to do it. So I listen to them, and then I can understand how to solve the problem and I feel happy learning from other students.”

“That is the neat part of ‘Pasifika Success Maths’ says George, “it allows students to question the maths not the personality of their peers.”



*Dr Roberta (Bobbie) Hunter*



### EXAMPLE OF A MATHS WORD PROBLEM USED LAST TERM

Polyfest 2014 is happening at the Velodrome in Manukau!



#### PROBLEM 1

The Polyfest is a competition where schools compete for supremacy in various cultural groups. According to Niu FM, this year there are 9000 students from 60 schools participating on the 5 cultural stages.

- What would the average number of participating students be per school?
- What would the average number of students be per cultural group. (Remember there are only 5 cultural stages.)

#### PROBLEM 2

The Polyfest is a competition where schools compete for supremacy in various cultural groups. If there were 9875 students from 65 schools participating on 10 stages.

- What would the average number of participating students be per school?
- What would the average number of students be per cultural group. (Remember there are only 10 cultural stages.)