

Weaving our knowledge together Uncovering Pasifika learners' mathematical funds of knowledge

Jodie Hunter, Bobbie Hunter, Louise Fitzgerald, John Tupouniua

Project dates: [2020 - 2022]

Intro / Project description

Key to developing equitable mathematics classrooms is educators making explicit connections to and building on the cultural, social, and linguistic contexts of diverse learners. With an equity focus, this project focused on facilitating young Pacific learners and their families to recognise and document their mathematical funds of knowledge. This was then shared with their teachers and used to develop and enact culturally relevant, mathematically challenging, group-worthy tasks.

Aims

The overall aims of this project were threefold: to (i) document multiple mathematical funds of knowledge of young Pacific people and their families by developing practical strategies to empower the participants to recognise their mathematical funds of knowledge and share these with educators; and support the equity agenda in schooling by (ii) examining how group-worthy mathematical tasks drawing on funds of knowledge are developed by teachers; and (iii) investigate the influence of culturally located tasks on students' mathematical learning, engagement, and disposition.



Research questions

- 1) What are the different mathematical funds of knowledge of young Pacific people and their families in New Zealand?
- 2) How can we as educators (both researchers and teachers) better understand and value the mathematical connections within diverse students' home and community activities and artefacts?
- 3) How can the application of students' experiences and their funds of knowledge be incorporated within group-worthy mathematical tasks?
- 4) How can funds of knowledge models be used to enhance equitable learning opportunities within the mathematics classroom?
- 5) How do opportunities to learn through group-worthy tasks based on a cultural context affect students' development of conceptual understanding of mathematics?
- 6) How does engagement with group-worthy tasks based on cultural contexts influence students' perceptions of mathematics and their role as mathematics learners?

Key findings

Engaging in documenting mathematical funds of knowledge with the use of photography and photo-elicitation provides a means for young Pacific people and their families to recognise and share their mathematical funds of knowledge. Participants noted that by the end of the project that they noticed that "there is maths literally everywhere. There is basically no place I can look that there is not maths". Also noticeable was a shift to a wider view of mathematics beyond number.

Young Pacific people and their families have a range of mathematical funds of knowledge connected both to cultural artefacts and participation in differing activities. These are commonly related to family funds of knowledge and include activities such as gardening, gathering fruit, and cooking as well as cultural activities and artefacts, and undertaking chores and household activities.

It is important for teachers to have opportunities to learn about diverse students' funds of knowledge related to mathematics. Drawing on student experiences and their funds of knowledge to develop group-worthy mathematical tasks requires careful thought and detailed planning.

It is challenging for teachers to incorporate multiple knowledge bases of students throughout the enactment and use of the mathematical task during mathematics lessons, however, the use of reflective activities and purposeful planning supports this.

Use and enactment of group-worthy mathematical tasks that connect to funds of knowledge and cultural resources offer opportunities for students to develop and strengthen their cultural identity while learning mathematics.

Implications for practice

Teachers need to be learners of student, family, and community funds of knowledge by recognising the expertise of families and children and both inviting them to share this and building on the strands of mathematics evident in the funds of knowledge.

Innovative methods such as photography and storytelling are useful ways to position children and families to document funds of knowledge related to mathematics that are not typically recognised.

Enacting tasks drawing on cultural, home, or community contexts requires care and thoughtful preparation to both honour the context and connect to mathematics. In-depth planning and preparation are required to successfully use contextual group-worthy tasks and draw on students' multiple knowledge bases.

Launching a contextual group-worthy task can support students to share their knowledge and assign them with status while also supporting students from different cultural backgrounds to share their related funds of knowledge.

Teachers should be provided with opportunities for collaborative task planning before lessons and reflective discussion following lessons.

The use of contextual mathematical tasks based on funds of knowledge and out of school experiences can have a positive impact on students' mathematical learning, engagement, and disposition.

Our partners:

Teachers and families from AMB School and AME Primary School.

Contact details:

Professor Jodie Hunter
Massey University
j.hunter1@massey.ac.nz