Culturally appealing maths materials

Some schools that use Count Me In Too, or other numeracy project teaching methods, can find it tricky to meet the needs of all young children in the first two years of schooling. Those who are progressing more slowly at mathematics and who are less autonomous learners tend to struggle to engage mathematically, and benefit from focused enrichment activities (Maher, 2007).

Experience from one school in New Zealand shows how children struggling with early mathematical ideas can benefit from customised mathematical activities in a targeted enrichment program using carefully crafted, culturally relevant materials and activities. In this school, the majority of five- and six-year-olds who were struggling with numeracy development were Māori and Pasifika children. They were all unable to count out eight beans from a pile, so were at the earliest stage of numeracy development.

To boost early mathematical development for these children, an early mathematics enrichment program focusing on the best predictors of later mathematics success was developed and implemented. These predictors were:

- numeral recognition
- pattern recognition
-rote counting
- sequence forwards
- enumeration
- forming sets (Young-Loveridge, 1991).

MATERIALS FOR ENRICHMENT INTERVENTION

Given the importance of engaging, riveting and culturally appealing mathematical equipment for young children (Krech, 2000), mathematics equipment was designed especially for these enrichment activities. For children who struggle with mathematics and who may be less motivated to engage in Western mathematical activities, it is important to have equipment with which they find resonance.

In the development of culturally relevant materials for this study, teachers and parents of the children in the enrichment group worked collaboratively considering the following:

- texture
- smell
- child-sized artefacts
- natural versus synthetic materials
- designs representative of different cultures
- intrinsically interesting materials
- collaborative activity
- social activity
- 'specialness'.

Material with Māori words for each number was included in the game and also proved popular with children not in the intervention enrichment group, who were already proficient at forming sets and combining them. Using these materials meant the children could practice their Māori counting vocabulary. All the materials for this activity were housed in a beautiful woven basket.
INTRODUCING THE MATERIALS

This school was committed to the philosophy of inclusive education, and was therefore anxious to respond to the diverse needs of all children who are seen as part of 'us' in the classroom (Nind & Wearmouth, 2005). This sense of 'us', these authors maintain, counters the inclination on the part of teachers and other children to see a group of labelled learners (such as those in an intervention program) as children with difference who become subliminally labelled as them.

In this study it was therefore vital to ensure that the equipment being introduced should not contribute to an us-and-them culture in the classrooms. Just as it was acknowledged that the ways materials are used will determine their success in learning, the way they were introduced to the whole class was considered to be just as important. The children who were to be a part of the enrichment intervention group felt no different from any of the others, as these materials were considered part of the regular classroom’s mathematics manipulatives. The materials were so enchanting and engaging in themselves that they were sought-after by both intervention and non-intervention children.

Thus, during free-choice time in the classrooms, such as during rainy-day lunchtimes (a common occurrence in New Zealand), children of all mathematics achievement levels often used the materials. Those more proficient at mathematics were practising their Māori language, while others were practising forming and combining sets. These types of interactions served to counter potential negative stereotyping of the materials and children in the early mathematics intervention group.

IMPLEMENTATION AND OUTCOMES

At the start of the early mathematics enrichment intervention, none of the children had a sense of cardinality, none could demonstrate one-to-one counting, nor were they able to combine sets. These children did an extra half an hour of mathematics each day for 20 weeks. There had been some discussion at the outset as to whether three children with severe developmental delays should be included in the intervention group, as there seemed little prospect of them benefiting; but, in line with the school’s philosophy of inclusion, they were included. At the end of the 20-week intervention these three children had not improved their mathematics skills, but all others had achieved levels of mathematics competence on par with other children in their class.

Of course, materials on their own will never replace good teaching, but culturally appealing mathematics materials enhance culturally diverse children’s willingness to engage, learn and be successful.

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References

Everyday learning about maths is a terrific resource to encourage young children to begin to see maths used in the everyday world around them and to think about maths ideas.

To order or find out more, please visit www.earlychildhoodaustralia.org.au/lath0503 or freecall 1800 356 900.