Aboriginal Early Numeracy

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Project Title	Aboriginal Early Numeracy: Recognising and Accommodating Different Starting Points in Number
Project Team	Dr Sandra Frid, Ms Kaye Treacy, Ms Fiona Walker, Ms Melanie Smith (SiMERR WA)
Period	October 2006 – July 2007
Funding Agency	SiMERR
Organisational Base	SiMERR WA

Description

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This project investigated the strategies Aboriginal children use in situations considered to be 'counting' situations from a western perspective; in particular, to see how Aboriginal children solve a problem where they are asked to make an equivalent set.

Eighteen Aboriginal students, in Years 1 to 11 at a remote community school in the Goldfields of WA, participated in task-based interviews based on 'counting' tasks. The tasks involved: fetching 'maku' (bardie grubs) to have enough to give all the people in a picture a maku; identifying a hidden quantity when a part of a collection of maku are covered; and standard counting tasks. The tasks were developed with, and the interviews conducted by, an Aboriginal Research Assistant, to ensure appropriate cultural and language contexts. These interviews were video recorded and then analysed with input from the Aboriginal research assistant.

Participants

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Eighteen Aboriginal students, in Years 1 to 11 at a remote community school in the Goldfields of WA.

Findings

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Most of the Aboriginal students in this study demonstrated specific counting knowledge and skills, yet they chose not to count in the Maku Task. Thus, although it was not always clear what strategies they did use for the Maku Task, the findings suggest that they did not see this situation as one in which counting is required. That is, a main finding, from a Western perspective, was that most of the students did not choose to use counting to make equivalent sets, instead using what seemed to be a process of 'estimation', even though they were able to count. Most of them were able to select the exact number of maku needed, or to select one more or one less than required, suggesting that these children did not see counting as an appropriate strategy for this type of situation. That is, the students regularly fetched a quantity of maku that was 'close' to what was needed, rather than counting. It appeared that the students were not concerned about precision or exactness, since being 'close' to the exact number (e.g., one more or one less) was sufficient to complete the task. Many of them were able to collect an appropriate number, suggesting that they were looking at the picture and using an estimation strategy to get a quantity of maku that would be 'about right' for the number of people.

Outcomes

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Published refereed papers

- Treacy, K., & Frid, S. (2008). Recognising different starting points in Aboriginal students' learning of number. In M. Goos, R. Brown, & K. Makar (Eds), Navigating currents and charting directions (Proceedings of the 31st annual conference of the Mathematics Education Research Group of Australasia, Volume 2, pp. 531-538). Adelaide: MERGA.

In progress:

- Treacy, K., & Frid, S. (2008, in progress). Gracie's story: Ten years old and she can count. Paper being prepared to submit to Australian Primary Mathematics Classroom.

Conference presentations

- Treacy, K., & Frid, S. (2008, June). Recognising different starting points in Aboriginal students' learning of number. Paper presented at the annual conference of the Mathematics Education Research Group of Australasia, Brisbane, Qld.
- Frid, S., Walshaw, M., & Dreyfus, T. (2008, June). Recognising different starting points in Aboriginal students' learning of number. Paper used as an exemplar in the Pre-Conference Workshop, Turning your conference paper into journal article, at the annual conference of the Mathematics Education Research Group of Australasia, Brisbane, Qld.

Impact

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The findings of this project indicate there is a need to develop activities that explicitly recognise, value and cater for the differing ways in which children interpret their experiences both in and out of school. More specifically, to support the numeracy development of Aboriginal children from a perspective that is culturally appropriate, it is essential that teachers and curriculum developers understand the ways these children interpret the purpose of numbers and counting. In addition, the findings of this study raise numerous issues for future research and for mathematics curriculum and teaching practices, including:

- Since this study was not able to clarify the question of whether some Aboriginal students use a matching strategy or whether they use family relationships in situations involving making equivalent sets, more in-depth research needs to be carried out that provides appropriate contexts and opportunities for the students to talk more extensively and to disclose more of what they are thinking and doing;
- Additional research needs to be conducted related to the findings of this study that Aboriginal students might have a tendency not to attend to exactness. The implications of these findings for teaching practices also need to be attended to, in that it cannot be assumed that Aboriginal students see a purpose for counting; a purpose needs to be made explicit in activities that a teacher uses to teach counting. In this regard there is also a need to be explicit about different cultural viewpoints, for example, the value and purpose of precision versus estimation or sharing;
- Students need to be provided with purposeful counting experiences with quantities beyond 100, to build their knowledge of the patterns in the number system and to connect quantities to this. Purposeful activities will be a challenge to identify for non-Aboriginal teachers, since what non-Aboriginal teachers might think of as purposeful might not be so for the Aboriginal students; and
- The students involved in this study were capable students, however they had not had a curriculum that was focussed on their learning needs. Without support and information, their teachers were planning lessons based on 'western' assumptions. They were not able to recognise what their students brought with them into the classroom, and were not aware of what they should be looking for. Teachers need to recognise the different starting points, and learning needs of all their students. This is difficult when teachers do not share the same cultural background as their students and there is little available information about what they should be looking for. There is a need to value what students can do and build on it, and a need to recognise and accommodate different starting points in number.

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