SCAFFOLDING NUMERACY IN THE MIDDLE YEARS
LINKAGE PROJECT 2003-2006

PROJECT DESCRIPTION AND ACKNOWLEDGEMENTS

The Scaffolding Numeracy in the Middle Years Linkage Project 2003-2006 was designed to investigate the efficacy of a new assessment-guided approach to improving student numeracy outcomes in Years 4 to 8. In particular, it was aimed at identifying and refining a learning and assessment framework for the development of multiplicative thinking using rich assessment tasks with a view to addressing the following research questions.

- To what extent can we accurately identify key points in the development of multiplicative thinking and rational number beyond the early years?
- To what extent can we gather evidence about each student's achievements with respect to these key points to inform the development of a coherent learning and assessment framework?
- To what extent can authentic assessment tasks be developed and used to assess student performance against the framework?
- To what extent does working with the tasks and the knowledge they provide about student understanding assist teachers to improve student numeracy performance at this level?
- What strategies and/or teaching approaches are effective in scaffolding multiplicative thinking and rational number understanding in the middle years?
- What are the key features of classroom culture and discourse needed to scaffold students' numeracy-related learning at this level?

A doctoral student, Ms Margarita Breed, was funded by the Australian Research Council and the industry partners to support the further development of the framework and work on the development and evaluation of targeted materials for those students identified as 'performance outliers'.

The methodology involved three overlapping phases. Phase 1 identified a broad hypothetical learning trajectory (Simon, 1995) which formed the basis of a Draft Learning and Assessment Framework for Multiplicative Thinking (LAF). Phase 2 involved the design, trial and subsequent use of a range of rich assessment tasks developed to evaluate various aspects of multiplicative thinking. The tasks, and their associated scoring rubrics, were variously used at the beginning and end of the project to inform the development of the LAF using Rasch modelling and other forms of analysis. Phase 3 involved research school teachers and members of the research team in an eighteen month action research study that progressively explored a range of targeted teaching interventions (Learning Plans) aimed at scaffolding student learning in terms of the LAF.

The study was conducted in six school clusters, 4 in Victoria (2 metropolitan and 2 regional) and 2 in Tasmania (both metropolitan). Each school cluster involved a secondary school and at least three primary schools. Just over 1500 Year 4 to 8 students and their teachers from the three research school clusters were involved in Phases 2 and 3 of the
A similar group of Year 4 to 8 students from the three reference school clusters was involved in Phase 2 only. In all, 40 schools were involved in the SNMY Project.

During the course of each phase, research team members met with project teachers to facilitate the implementation of the project, provide professional development, and support the development of learning plans and school-based authentic tasks. For example, a detailed description of the project was prepared and distributed at the Cluster Leaders Meetings in December 2003 and February 2004 (see Initial Cluster Leaders Meetings). This was supported by a powerpoint presentation to research school teachers in February/March 2004 (see SNMY Research Cluster Meetings 04), an abridged version of which was presented to reference school teachers in April/May 2004 (see SNMY Reference Cluster Meetings 04). To support the use of the Draft Learning and Assessment Framework, a summary of the key ideas and strategies that underpin multiplicative thinking was made available to research school teachers in March 2004 (see SNMY Key Ideas and Strategies Mar 04).

A more detailed description of the development and use of the assessment tasks, the use of Rasch modelling to evaluate both the tasks and to map student learning over time, and a summary of project findings is provided elsewhere on this CD-ROM, together with the materials and resources developed and used over the course of the project.

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