

A FRAMEWORK FOR EXAMINING NUMERACY EDUCATION PARTNERSHIPS BETWEEN FAMILIES, SCHOOLS, AND COMMUNITIES

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This paper provides an overview of an Australian research project that analysed key features of educational partnerships supporting children's numeracy learning. It presents the framework we constructed to analyse case studies of partnerships characterised by diversity and disadvantage. The dimensions of the framework attend to (a) partnership initiation strategies (top-down, top-supported, school-generated, home- or community-generated), (b) stakeholder perspectives on their roles (school-centred, family-centred, community-centred), (c) the groups of educationally disadvantaged students targeted by programs (Indigenous, non-English speaking, low socio-economic background, low achieving, geographically isolated), and (d) numeracy practices and the types of knowledge – mathematical, strategic and contextual – associated with these.

This project was commissioned by the Australian Government Department of Education, Science and Training to provide information on practices in home, school and community partnerships to support children's numeracy development in the 1-2 years prior to school and in the primary years of schooling. Our understanding of the two key terms in this brief – *partnerships* and *numeracy* – shaped the ways in which we approached the project. First, we took the view that this study should not be limited to investigating numeracy learning and teaching practices in pre-school and primary school classrooms, since this would ignore a feature of the project that makes it unique in the Australian context, the focus on partnerships that extend beyond schools and include other important contexts in which children live, develop, and learn. This broader focus supports the interpretation of numeracy found in the Australian Government's policy document, *Numeracy – A Priority for All* (DETYA, 2000). Here, numeracy learning is acknowledged to involve the development of children's mathematical knowledge and skills, and the fostering of capacities and dispositions to make effective use of this learning in order to deal with the general demands of life.

The composition of our research team reflects these twin emphases on partnerships and numeracy. We represent a team of eleven researchers from five universities who have a broad range of disciplinary and methodological expertise. Our individual research interests include mathematics learning in early childhood, primary and secondary school settings, parental involvement in and attitudes towards mathematics education, and the study of youth, families and communities from sociological and anthropological perspectives. We fused these interests to create an interdisciplinary approach to the project that yielded insights into the current status of home, school and community partnerships around numeracy education in Australia and identified future research priorities in this area. The purpose of this paper is to give an overview of the design of the project and discuss the analytical framework we constructed to capture different perspectives on partnerships.

PARTNERSHIPS TO SUPPORT CHILDREN'S NUMERACY: FRAMING OF KEY ISSUES

Our review of international and Australian literature showed that home and community partnerships with schools can make a significant contribution to improving the academic achievement of students; however, not enough is known about what underlies successful partnership practices to support children's numeracy learning. We structured our discussion of this literature around four issues, summarised briefly here due to space limitations. First, we examined the concept of partnerships and the construction of parental and community involvement in children's education in different countries, noting in particular the tendency for research and practice to be focused on school-centred initiatives. Second, we constructed a theoretical framework to analyse partnerships and the various types of connections between the three domains of interest. Third, we used this theoretical framework to identify the main types of partnerships explored in the literature from the perspectives of the different stakeholders, thus enabling us to classify partnerships as being either school-centred, family-centred, or community-centred. Fourth, we defined critical issues and areas for further research on partnerships.

RESEARCH DESIGN

The design of the research consisted of three phases. The first phase began with a questionnaire survey of organisations representing education and child care providers, professional associations, research organisations, and parent and community groups. We then conducted an email survey of a representative sample of primary schools throughout Australia. The purpose of the surveys was to obtain Australia-wide data on the distribution and scope of current programs and practices. The second phase involved interviews with key personnel in the central offices of the government and non-government education sectors in each Australian State and Territory. The purpose was to identify programs or initiatives that connected schools with families and communities to support children's numeracy learning. In the third phase, we carried out case studies of seven exemplary, sustained numeracy education programs featuring family, school, and community partnerships. Two researchers collected data at each case study site over a period of 3-6 days, using the following methods:

- observation of classrooms and other school-based activities, parent workshops, and families in their homes;
- interviews with individuals and focus groups comprising teachers, school administrators, school support staff, School Council representatives, parents;
- analysis of documents including teaching and assessment materials, extracts from school textbooks, parent workshop materials, school newsletters and staff memos, student work samples, school policy documents and program handbooks, program evaluation reports and materials.

ANALYTICAL FRAMEWORK

Our framework for selecting and analysing the case studies was developed from the method we used to record and categorise key features of partnership programs identified from the interview phase of the study. The analytical framework takes into account:

- evidence of the impact of programs and practices in terms of evaluation of outcomes and program sustainability;
- level of schooling (pre-school or primary);
- different ways of initiating partnerships and their implications for parental and community involvement in numeracy education;
- stakeholder perspectives on the links between schools, families and communities;
- attention given to the needs of educationally disadvantaged children;
- numeracy practices.

The process of selecting cases began by identifying those that had been evaluated, either formally or informally, and had been sustained over a period of time. From this subset we chose the final suite of seven cases so as to sample a range of partnership initiation strategies, stakeholder perspectives, target groups of students, and numeracy practices.

PARTNERSHIP INITIATION

The first dimension of the framework attends to relations between educational systems, schools, families and communities in terms of how partnerships are initiated and funded. *Top-down* partnerships are initiated and sponsored by an education system with uniform program goals and processes across schools. *Top-supported* partnerships rely on an education system for some overall sponsorship or coordination, but schools design and control the program. *School-generated* partnerships are initiated by a school independently of an education system, although this may involve resources available from the system. *Home or community-generated* partnerships have their origins in these sectors and are designed and implemented with input from families and community members.

STAKEHOLDER PERSPECTIVES

The second dimension of the framework recognises the different perspectives of stakeholders on what constitutes partnerships and what their roles might be. These perspectives may be school-centred, family-centred, or community-centred. To understand *school-centred* perspectives we drew on Epstein's (1995) work on home-school partnerships to describe how schools understand the roles of families and communities in terms of parenting, communicating, volunteering, learning at home, decision-making, or collaborating with the community.

Studies of the ways in which families connect with schools and their communities are relatively under-represented in the literature. We identified the following *family-*

centred perspectives to describe how families might see these connections (James, Jurich & Estes, 2001; Jordan, Ozorco, & Averett, 2001; Katz, 2000):

- Creating supportive learning environments at home;
- Parental support for the child and parental aspirations for the child's education;
- Parents as role models for the value of education;
- Home practices that support numeracy development;
- Parent-directed activities that connect children to out-of-school learning opportunities;
- Parent-child discussions and interactions about school-related issues and activities.

In defining *community-centred* perspectives we drew on issues discussed by Jordan et al. (2001) and Keith (1999) concerning ways in which communities see their links with schools and families:

- Community-driven school reform and curricular enrichment efforts that seek to improve local schools;
- School-business partnerships;
- School-university partnerships;
- Community service learning programs;
- After-school programs;
- More extended programs that target children's and family numeracy (e.g., the Family Maths Program).

TARGET GROUPS

The third dimension of the framework identifies the groups of students targeted by the program in terms of educational disadvantage or diversity. These include students from Indigenous, non-English speaking, and low socio-economic backgrounds, and low achieving students deemed to be at risk of failing to meet mandated benchmarks for numeracy performance. We also allowed for the possibility that programs might not target specific groups of students. This dimension additionally took note of the geographical location of the program (urban, rural/regional, remote).

NUMERACY PRACTICES

We identified numeracy practices in each case study by referring to the description of numeracy found in the Australian Government's numeracy policy document: "To be numerate is to use mathematics effectively to meet the general demands of life at home, in paid work, and for participation in community and civic life". This definition highlights three important aspects of numeracy and the types of knowledge associated with each. To "use mathematics", students need to have *mathematical knowledge* of concepts and skills. Using mathematics "effectively" requires that students have *strategic knowledge* to enable them to choose and apply mathematical concepts and skills that are appropriate for dealing with unfamiliar problems. Using mathematics effectively "to meet the general demands of life"

reminds us that numeracy is context-specific because mathematics is embedded in everyday situations. Thus numerate practice requires *contextual knowledge*.

ORGANISATION OF THE SYMPOSIUM

Figure 1 illustrates how we use this framework to structure the remainder of the symposium: we present and analyse cases to highlight the different partnership perspectives of families, schools, and communities, with different types of student target groups, in diverse geographical locations.

Dimension of analytical framework	Case Study	
	Paper #2 Mobile Pre-School	Paper #3 Distance Education Centre
Partnership initiation	Top supported	Top down
Stakeholder perspectives highlighted in the analysis	Community-centred: <ul style="list-style-type: none"> • community driven school reform 	Family-centred: <ul style="list-style-type: none"> • creating supportive learning environments • home practices that support numeracy development
Target group	Indigenous	No specific group
Geographical location	Remote	Rural
Numeracy practices	<ul style="list-style-type: none"> • Mathematical knowledge: developed by play box activities • Strategic knowledge: not a specific focus • Contextual knowledge: activities generally not related to local Indigenous context 	<ul style="list-style-type: none"> • Mathematical knowledge: standard syllabus • Strategic & contextual knowledge: Parent modifies learning materials and uses everyday contexts to explain mathematical concepts

Figure 1. Dimensions for analysis of case studies.

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