

## Leading a Curriculum Reform from Inside a School

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This case study examines which domains of knowledge underpin effective lead teacher practices that develop teacher capacity and increase student learning. The main focus was on identifying the domains of knowledge perceived by lead teachers themselves, principals, and teachers as critical to effective leadership practice. Four domains of knowledge perceived to be important were knowledge of, and attitude towards, mathematics, knowledge of students as learners, knowledge of teachers as learners, and knowledge of communities as learners.

### Background

The central focus of the New Zealand Numeracy Development Projects (NDP) is to raise student achievement in mathematics by improving the professional capability and capacity of teachers across all New Zealand schools. The NDP began as a pilot study in 2000 in response to the poor performance of New Zealand students in the Third International Mathematics and Science Study (TIMSS) (Garden, 1997; see Higgins, Parsons, & Hyland, 2003).

As the NDP has progressed, the emphasis has shifted as a result of regular evaluations commissioned by the Ministry of Education<sup>1</sup>.

The NDP is moving into a phase in which the emphasis is not only on improving the teaching and learning of mathematics in New Zealand schools but also on enhancing the capacity of the schools to sustain and build on that learning. (Ministry of Education, 2005, p. 4)

In 2004 and 2005, the Ministry commissioned evaluations that looked specifically at sustaining practice in schools (for example, Thomas & Tagg, 2004; Thomas & Ward, 2005<sup>2</sup>). In response to the need to develop in-school sustainability, there was an increased focus on the lead teacher component of the NDP professional development. In a 2005 case study, Thomas and Ward (2006) found that some participants in their research appeared to misunderstand the scope of the programme by viewing the development as the workshop component only. These participants had a narrow view of professional development and believed that on-going in-depth external support was required for them to sustain the development. In response to Thomas and Ward's finding, the case study reported on here specifically investigated perceptions of leadership content knowledge as they applied to the NDP.

A school-based lead teacher approach to professional development has been less frequently used in New Zealand schools compared with the more usual externally imposed "one-size-fits-all" model of professional development typically implemented through a design adherence approach (Higgins, 2005). In the lead teacher initiative of the NDP, the external facilitator's role is to support the lead teacher in developing their knowledge and professional practice in the context of their school setting.

As well as undertaking administrative tasks, lead teachers are responsible for liaison and communication within the school community while also performing a significant professional development role. The

<sup>1</sup> The reports can be retrieved from [www.tki.org.nz/r/literacy\\_numeracy/litnum\\_research\\_e.php](http://www.tki.org.nz/r/literacy_numeracy/litnum_research_e.php)

<sup>2</sup> The latter report found that lead teachers had increasing confidence in leading professional practice within their schools.

Ministry of Education website states that the personal qualities necessary for lead teachers include enthusiasm and interest in mathematics and the ability to effectively support colleagues (Ministry of Education, 2006). Goleman, Boyatzis, and McKee (2002) defined resonant leaders as being “in sync” with their colleagues and having a high level of emotional intelligence that enables them to form “an emotional bond that helps them stay focused even amongst profound change and uncertainty” (p. 21).

This current case study examines the perceptions that facilitators, lead teachers, principals, and teachers have of the knowledge underpinning effective lead teacher practices.

## Rationale

As researchers, we must ask *What domains of knowledge inform leadership actions that shift teacher practice and enhance student outcomes?* A study of leadership knowledge provides a frame for examining the leadership that is occurring, how it is applied, and why it takes the particular forms it does. Research on leadership practices clarifies what leaders actually do, and why. Research on teaching and learning provides important clues about which practices are likely to make a difference (Robinson, 2004, p. 41) and focuses on what leaders do as well as on what they think about what they do (Stein & Nelson, 2003).

Within the school community, it is important that there is a shared understanding of the lead teacher’s role. Without a shared understanding of leadership, the emphasis can be deflected from a focus on leadership of the NDP to administrative tasks. Elmore (2000) argues that “leadership is the guidance and direction of instructional improvement” (p. 13). The leadership goal is not only to develop a vision, build a good relationship within the school community, and manage the school or department efficiently, but also to do all those things in a manner that improves teaching and learning (Robinson, 2004, p. 40).

Knowledge of leadership moves beyond rhetoric about leadership styles, in which a leader’s personal attributes are used to judge their effectiveness, to valuing domains of knowledge underpinning leadership practice. If discussions about leadership are restricted to a leader’s style, then we run the risk of making the assumption that the style holds constant across different situations; despite years of research, no conclusions have been made about the effectiveness of leaders based on their different styles (Robinson, 2004).

## Theoretical Frame

The complexities of leading a curriculum reform from within a school can be understood through viewing the school as an organisational system. Within such a system, there are a number of participants, each with different roles. In this study, we focus on three key members of the school community: the lead teacher, the principal, and the teachers. Together, these participants are part of a community that operates according to a set of rules (explicit and implicit). We were interested in how the elements of the school system transform opportunities for teacher learning. The analysis was guided by previous work that examined the ways in which orientations to professional development varied from those concerned with adhering to the design of the professional development programme to those that attend to the context through emphasising the programme’s principles (Higgins, 2005).

The study draws on socio-cultural perspectives, such as those articulated by Wertsch, del Rio, and Alvarez (1995) that suggest a lead teacher’s role is to mediate core principles of a project and their

enactment in the classroom and the wider school settings. Of particular relevance to this paper are schema relating to professional learning that are classroom-based professional learning and school-based professional community (Higgins & Parsons, 2005).

Shulman (1986) argues that teachers needed a qualitatively different kind of knowledge that would enable them to help others learn. This knowledge was defined as pedagogical content knowledge (PCK), that is, knowledge of ways to represent and explain a subject to make it comprehensible and knowledge of the thinking that students bring to the learning of a subject that makes it easy or difficult to learn.

Stein and Nelson (2003) contend that leaders need a qualitatively different kind of knowledge that will enable them to lead. They believe that leadership content knowledge is required for effective instructional leaders to improve teaching and learning in their schools. Leadership content knowledge is described as “standing at the intersection of subject matter knowledge and the practices that define leadership” (p. 424). Leadership content knowledge enables curriculum leaders and principals to recognise strong instruction when they see it, to encourage it when they do not, and to set the conditions for continuous academic learning among their staff.

## Method

### *Participants*

This case study investigated the lead teacher component of a system-wide project (NDP) begun in 2000, which, to date, has involved over 25,000 primary teachers in New Zealand. This specific study focused on 28 lead teachers, 21 principals, 106 teachers, and three facilitators working in 21 schools across three urban areas in the North Island of New Zealand. Each school was completing their third year of the NDP professional development, and the lead teachers had varying degrees of experience in leadership roles as well as a range of experience with the NDP. Table 1 sets out the number of schools approached and how many accepted the offer to be part of the study. (The reasons given by schools for declining to participate in this research included changes in principals and lead teachers and schools feeling that they were already overloaded in terms of professional development and additional research requests.) The table also includes the numbers of lead teachers and principals interviewed and the number of teacher surveys returned. The total number of participants in the study was 158. The data from the facilitators is not included in the later tables presented but has been used to confirm the findings from the school community participant groups ( $n = 155$ ). Online surveys were used to obtain demographic data that showed that most of the participants taught in schools larger than 200 students. Over half these schools were in the upper deciles. Most participants were female, representing a range of teaching experiences. Few participants had any mathematical qualifications.

Although they did not have any previous facilitation experience, most lead teachers had previous lead teacher experience spread across literacy, mathematics, and social studies. About three-quarters of the lead teachers currently held positions of responsibility with management units for curriculum areas other than numeracy.

Table 1  
*Participants in the Study*

	Schools approached (n = 33)	Schools accepted (n = 21)	Percentage of schools accepted	Facilitator interviews (n = 3)	Lead teacher interviews (n = 28)	Principal interviews (n = 21)	Teacher forms survey distributed (n = 258)	Teacher forms survey returned (n = 106)	Percentage of teacher survey forms returned
Region A	19	12	63%	1	13	12	130	55	42%
Region B	7	4	57%	1	6	4	50	19	32%
Region C	7	5	71%	1	9	5	78 <sup>3</sup>	32	41%
Totals	33	21		3	28	21	258	106	

### *Procedures and analysis*

The interview and survey questions were designed to elicit evidence from multiple sources including lead teachers, principals, teachers, and facilitators. The key purpose of the interviews was to investigate the ways in which lead teachers of numeracy developed their professional practice in order to improve their own and other teachers' content and pedagogical knowledge of mathematics. Drawing from the study by Stein and Nelson (2003), the questions focused on the effectiveness of the lead teacher model, the impact of the role on lead teachers' own knowledge and practice, teachers' pedagogy, and the impact of lead teachers on the school community.

Methods of data collection included:

- Online survey
- Face-to-face interviews with lead teachers, principals, and numeracy facilitators
- Postal questionnaires with teachers.

Lead teacher and principal interviews and teacher surveys were reviewed using a content analysis approach to identify recurring themes in the transcripts (Denscombe, 1998). The emerging common themes were cross-checked for consistency and reliability by another researcher, with any differences in classification being resolved through discussion. To give an overall picture of the themes across the three regions, the number of common references made by each participant group was then expressed as a percentage of the total comments.

## **Findings**

Building on the construct of leadership content knowledge for school administrators proposed by Stein and Nelson (2003), four categories emerged from the recurring themes in the data. The four categories of leadership content knowledge for lead teachers are defined as knowledge of, and attitude towards, mathematics; knowledge of students as learners; knowledge of teachers as learners; and knowledge of communities as learners. Each category is discussed separately, using participants' comments to illustrate themes.

### *Knowledge of, and Attitude towards, Mathematics*

The category of knowledge of, and attitude towards, mathematics evolved from references to mathematics content knowledge and disposition towards mathematics. Principals and teachers

<sup>3</sup> One school from region C declined to participate in the teacher survey.

from all regions believed that lead teachers needed excellent content knowledge at all levels of schooling.

Our lead teacher ... has exceptional content and pedagogical knowledge and is continuously striving to build on this. She makes links with wider community networks, ensures that resources are available, and works very hard to support and educate staff. (Teacher, region A)

By contrast, the lead teachers placed more significance on their enthusiasm and passion for mathematics than they did on their content knowledge.

Because I have a passion for mathematics, so it's been something that I'm really pleased that they're spending more time on. We are certainly finding that passion is the key to success. (Lead teacher, region C)

Table 2 shows the relative emphases placed on lead teacher knowledge of, and attitude towards, mathematics from the perspectives of lead teachers themselves and of the principals and teachers with whom they are working. Of particular interest is the comparatively lower emphasis placed by lead teachers on their mathematics content knowledge (two references) compared with 16 and 46 references respectively for principals and teachers.

Table 2

*References to Lead Teacher Knowledge of, and Attitude towards, Mathematics<sup>4</sup>*

	Lead Teachers (n = 28)	Principals (n = 21)	Teachers (n = 106)	Total (n = 155)
Lead teachers' mathematics content knowledge at all levels	2	16	46	64
Lead teachers' enthusiasm and passion for mathematics	10 <sup>5</sup>	5	18	33

### *Knowledge of Students as Learners*

Knowledge of students as learners comprises pedagogical knowledge and the promotion of evidence-based practice. Within the area of knowledge of students as learners, about half the principals and teachers indicated that it was important for lead teachers to have excellent pedagogical knowledge at all levels of schooling. Lead teachers did not give the same emphasis to pedagogical knowledge (two references).

We have had follow-up workshops as a staff to cement some of the knowledge and to refine various planning and teaching approaches. She's helped cement the knowledge that comes from the project and discuss it as it relates to practice. ... We're going through the process of working with staff to refine some of our beliefs and practices around numeracy, and that is still going on at this stage. (Principal, region B)

Almost half the lead teachers and nearly two-thirds of principals placed importance on the need for lead teachers to promote evidence-based practice, but few teachers made reference to lead teachers promoting this source of knowledge about students as learners.

She directs the teachers to look at the kids, to use the evidence to identify the kids that we need to be concerned about. We collectively talk about it at management and then in their syndicates. This helps to develop our community of learners. (Principal, region A)

<sup>4</sup> It was possible for participants to give more than one answer.

<sup>5</sup> Individual participants may have referred to both aspects of knowledge, while other participants may not have commented on either aspect. Therefore it is not possible to show the total number of comments across the categories. A later section shows the numbers of comments across participants for any one category.

Table 3  
References to Lead Teacher Knowledge of Students as Learners<sup>6</sup>

	Lead Teachers (n = 28)	Principals (n = 21)	Teachers (n = 106)	Total (n = 155)
Lead teachers' mathematics pedagogical knowledge	2	11	45	58
Lead teachers' promotion of evidence-based teacher practice	12	13	7	32

### Knowledge of Teachers as Learners

The domain of knowledge of teachers as learners is made up of four sub-categories: knowledge of contextually responsive practice, respect as a teacher, organisation of personnel, and organisation of resources. Approximately a third of the lead teachers felt that it was important that they were responsive to, and respectful of, individual needs of teachers at their school. A similar proportion felt that it was important to be respected as an expert teacher and have good organisational skills.

People have been at all different places on the road to learning with numeracy and I've been able to provide the right sort of support to all the teachers as they needed it. (Lead teacher, region B)

In my role I've learned that it's a continuum – people come onto the continuum at different places, they then move at different speeds. Some people come on right at the beginning and are so enamoured by it all that they just race through, and other people come in halfway and they won't move, and it's taking all of that into consideration. (Lead teacher, region C)

A fifth of the teachers valued a contextually responsive approach from someone they regarded as an expert teacher, and more than half the principals believed that the lead teacher should provide a positive role model as an expert teacher. However, few principals commented directly that the lead teacher tailored their practice to the needs of individual teachers.

A third of the principals indicated that they valued a lead teacher's skills in personnel organisation. None of the principals saw resource management by the lead teacher as a separate issue.

You've got to have a teacher who's well respected in the school and someone who's acknowledged as being a good practioner themselves. You've got to be organised, respected, and able to walk the talk. (Principal, region A)

A quarter of the teachers rated the organisational skills of the lead teacher as important, as well as valuing their resource management skills.

The lead teacher must be an expert of numeracy and be a willing role model for observational sessions of best practice. (Teacher, region B)

Table 4  
Reference to Lead Teacher Knowledge of Teachers as Learners<sup>7</sup>

	Lead Teachers (n = 28)	Principals (n = 21)	Teachers (n = 106)	Total (n = 155)
Knowledge of contextually responsive practice	9	2	19	30
Respect as a teacher	9	11	16	36
Organisational skills	8	8	27	43
Resource management	0	0	23	23

<sup>6,7</sup> It was possible for participants to give more than one answer.

### *Knowledge of Communities as Learners*

The domain of knowledge of communities as learners comprises knowledge of relationship building, knowledge of their school, knowledge of developing a community of learners within the school, and knowledge of sustaining an initiative.

Lead teachers' interpersonal skills were ranked as important by about three-quarters of principals and teachers and about two-thirds of lead teachers. These skills were generally described as being approachable, a good listener, and accessible.

To me the most important thing is the interpersonal skills. If they don't have those, it doesn't matter how good their classroom is, no one will want to go near them. And it doesn't matter what else they have because without those interpersonal skills they will be ineffective. (Principal, region B)

The lead teacher must be friendly, approachable, flexible, supportive and passionate. (Teacher, region C)

I'm very supportive, I have good relationships with people and enthusiasm for the maths that we are doing and a positive attitude that allows me to work easily and enjoyably with people. (Lead teacher, region A)

Principals and lead teachers valued a lead teacher's commitment to developing and sustaining a community of learners through maintaining the momentum and focusing on the needs of the community.

It is important to me that they are able to contextualise their new learning to our school and to be able to implement new ideas at our school by getting people on board. (Principal, region A)

We regularly share our planning, or things that have worked well, or ask what our next steps might be. I want there to be a school-wide professional learning community where there is openness with information and with skills. (Lead teacher, region A)

However, both principals and lead teachers believed that, as well as being supportive, the lead teachers also needed to take a somewhat hard-line approach and not allow any excuses to get in the way of schools achieving their goals.

They need to have the ability to make teachers front up. To stand up and say "hey, we need this to happen." They need to be able to motivate others into making a difference. (Principal, region A)

They need to have a balance of patience and impatience, they need to be prepared to nudge people along and to do the hard stuff when people are being resistant or are offering a series of excuses. (Principal, region B)

I need to be able to observe others and critically reflect with them and give honest feedback and advice. Not just being nice but being honest. (Lead teacher, region A)

I haven't allowed anyone to "get off the bus"; I have made sure that I have continually encouraged and supported everyone (and some have needed more encouragement than others) to keep going on the journey. (Lead teacher, region B)

I don't accept "no" from anyone, I'll say "okay, let's see if we can't sort this out together" but I don't allow people to do nothing. (Lead teacher, region C)

Each group valued the lead teacher accepting the role of co-learner within the school community and being a positive role model for colleagues.

I need to model being a learner, to show that I am also learning and to show that I want to learn. I need to be passionate about the project and the professional development. (Lead teacher, region C)

You've got to be willing to change and model that you are also learning. When you model that, teachers look over and go "oh well, she's prepared to give it a go." (Lead teacher, region C)

Being able to observe and provide effective feedback were practices that were valued by all participants.

The lead teacher needs to be confident about modelling their own practice and coaching colleagues through theirs. (Teacher, region A)

I would like my lead teachers to be given more time to observe me and give me critical feedback so that my maths programme will continue to improve. (Teacher, region A)

I would like more visits to my classroom so that I could see an effective lesson being modelled and could give and get some feedback. (Teacher, region C)

The NDP facilitators from each region believed that a school-wide focus on the NDP was the key to sustainability. If the NDP is left to develop within syndicates or smaller groups, there is a danger of too many differences and misunderstandings arising. Alignment and synchrony come from school-wide focuses, discussions, and practices.

Models for planning are explored and refined school-wide. Assessment and reporting procedures have been aligned school-wide to demonstrate learning to teachers, students, and parents. (NDP facilitator, region A)

In-class observations and support have led to increasingly synchronised and sustainable practices. This has come from lead teacher commitment to the whole school. (NDP facilitator, region B)

Table 5  
*Reference to Lead Teacher Knowledge of Communities as Learners<sup>8</sup>*

	Lead Teachers (n = 28)	Principals (n = 21)	Teachers (n = 106)	Total (n = 155)
Knowledge of relationship building	18	17	75	110
Knowledge of developing a community of learners	21	12	29	62
Knowledge of their school	11	5	1	17
Knowledge of the sustaining an initiative	0	4	22	26

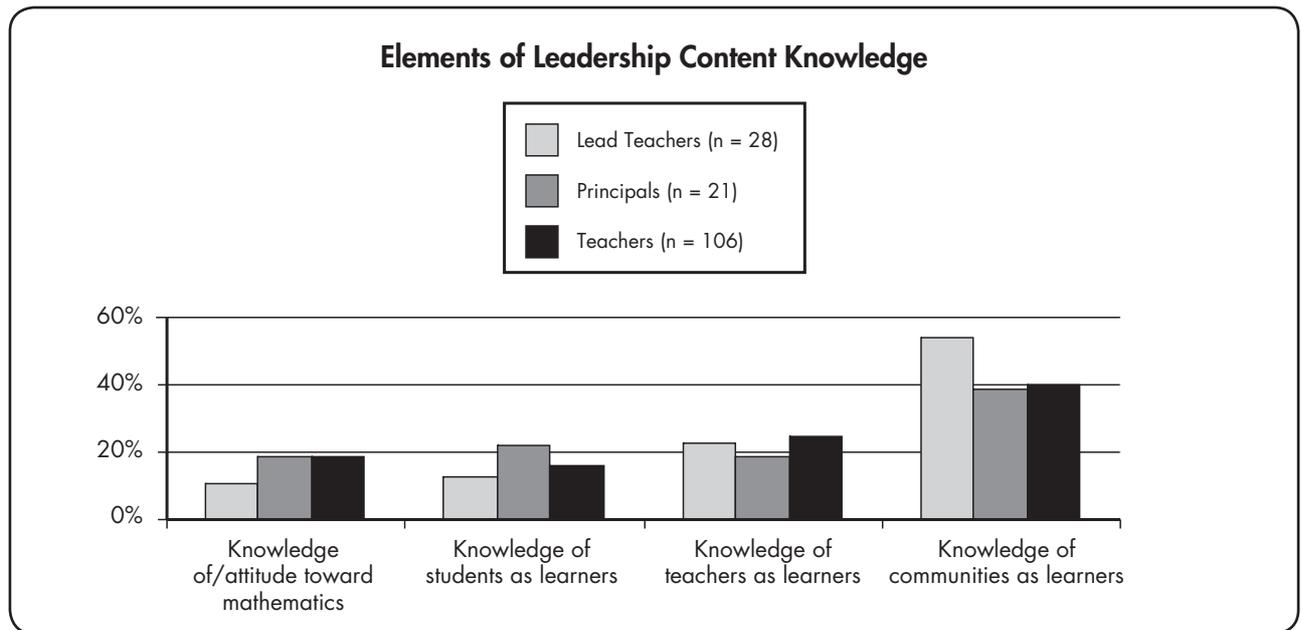
## Discussion

The construct of leadership content knowledge for lead teachers has evolved from the emphasis that lead teachers, principals, and teachers give to lead teachers' knowledge of, and attitude toward, mathematics, knowledge of students as learners, knowledge of teachers as learners, and knowledge of communities as learners. This section examines the relative importance of the components as perceived by different participants.

### *Relative Importance of the Components of Lead Teacher Knowledge*

The relative importance of the four domains of lead teacher knowledge varies across the participant groups of lead teachers, principals, and teachers as shown in Figure 1. The overall pattern that emerged showed that principals and teachers regarded the knowledge of mathematics more highly than the participating lead teachers. A similar pattern can be seen for importance placed on lead teachers' knowledge of students as learners, with a smaller proportion of lead teachers believing this knowledge was important. Similar proportions of lead teachers, teachers, and principals perceived knowledge of teachers as learners as important. Relatively speaking, it appeared that lead teachers perceived knowledge of communities as learners as the most important knowledge for lead teachers to have.

<sup>8</sup> It was possible for participants to give more than one answer.



*Figure 1: Perceptions by lead teachers, principals, and teachers of the relative importance of components of lead teacher knowledge*

The complexities of the interrelationships may be critical to sustaining an initiative through building knowledge of how to foster communities as learners in schools. With this study involving relatively small numbers of geographically-bound lead teachers, further research that investigated the elements of leadership content knowledge would be useful.

Without knowledge that connects subject matter, learning and teaching to acts of leadership, leadership floats disconnected from the very processes it is designed to govern. (Stein & Nelson, 2003, p. 446)

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## References

- Denscombe, M. (1998). *The good research guide for small-scale social research projects*. Buckingham: Open University Press.
- Elmore, R. F. (2000). *Building a new structure for school leadership*. Washington DC: Albert Shanker Institute.
- Goleman, D., Boyatzis, R., & McKee, A. (2002). *Primal leadership*. Boston: Harvard Business School Press.
- Garden, R. (Ed.) (1997). *Mathematics and science in middle primary school: Results from New Zealand's participation in the Third International Mathematics and Science Study*. Wellington: Ministry of Education.
- Higgins, J. (2005). Pedagogy of facilitation: How do we best help teachers of mathematics with new practices? In H. L. Chick & J. L. Vincent (Eds), *Proceedings of the 29th annual conference of the International Group for the Psychology of Mathematics Education* (Vol. 3, pp. 137–144). Melbourne: PME.
- Higgins, J., Parsons, R., & Hyland, M. (2003). The Numeracy Development Project: Policy to practice. In *New Zealand Annual Review of Education 12: 2002*, pp. 157–175. Wellington: Victoria University.
- Higgins, J. & Parsons, R. (2005). Shifting reform ownership: Generating collective agency through a participatory dynamic. Paper presented at Redesigning Pedagogy: Research and Practice Conference, National Institute of Education, Singapore.

- Ministry of Education. (2005). *The numeracy story continued: What is the evidence telling us?* Wellington: Learning Media.
- Ministry of Education. (2006). NZ Maths website lead teacher information. Retrieved 13 March 2007 from: <http://www.nzmaths.co.nz/numeracy/Principals/SupportingLT/LeadTeacherResponsibilities.aspx>
- Robinson, V. (2004). New understandings of educational leadership. *Set*, 3. Wellington: NZCER.
- Shulman, L. S. (1986). Those who understand: Knowledge growth in teaching. *Educational Researcher*, 15, 4–14.
- Stein, M. K. & Nelson, B. (2003). Leadership content knowledge. *Educational evaluation and policy analysis*, 25 (4), 423–428.
- Thomas, G. & Tagg, A. (2004). *An evaluation of the Early Numeracy Project 2003: Exploring issues in mathematics education*. Wellington: Ministry of Education.
- Thomas, G. & Ward, J. (2005). *Sustaining Numeracy Development Pilot Projects 2004: Exploring issues in mathematics education*. Wellington: Ministry of Education.
- Thomas, G. & Ward, J. (2006). Sustaining the Numeracy Project: The lead teacher initiative 2005. In *Findings from the New Zealand Numeracy Development Projects 2005* (pp. 115–128). Wellington: Learning Media.
- Wertsch, J., del Rio, P., and Alvarez, A. (Eds) (1995). *Socio-cultural studies: History, action and mediation*. Cambridge: Cambridge University Press.