

Copyright is owned by the Author of the thesis. Permission is given for a copy to be downloaded by an individual for the purpose of research and private study only. The thesis may not be reproduced elsewhere without the permission of the Author.

# **Parent Engagement in Mathematics Education**

A thesis presented in partial fulfilment of the

requirements for the degree of

Master of Education (MEd)

at Massey University, Palmerston North, New Zealand

***Lisa Jane Haenga***

**2015**

## Abstract

While parents can partner with schools in many ways, research in both the New Zealand and international contexts draws attention to need for schools to further consider how they can more effectively engage with parents to achieve positive outcomes on learning (Robinson, Hohepa & Lloyd, 2009). This study, grounded in a sociocultural perspective and drawing on ‘funds of knowledge’ ideas, seeks to better understand ways in which home-school partnerships that respect the needs and contributions of all participants—students, parents/whanau and teachers—might be developed in the area of mathematics. Of particular interest are the everyday activities in which families are involved and how improved parent awareness of the mathematical opportunities presented in these activities might increase parent confidence to participate in mathematical discussions with their children at home and in their community setting.

A review of the literature identifies; parents’ beliefs regarding their role in the learning, parents’ sense of personal efficacy in relation to their ability to effectively help their child, the relationship between teacher and parent, and parents’ life context, all as impacting the development of effective home-school partnerships. In addition, the historical positioning of parent’s is also recognised as playing a part in determining parents expectations for involvement and the way in which they relate to their children’s teachers and school leadership.

This study draws on qualitative research methods and uses a Design Based Research approach. Sixteen parents along with their students ranging from year five to year eight from a New Zealand primary school participated in a series of six mathematics workshops aimed at exploring the research question:

In what ways can parents’ confidence to engage in mathematics learning be better supported?  
A secondary question considered is, how might the increased awareness of opportunities connected to everyday experiences/activities support parent confidence to engage in mathematical discussions at home and in their community setting?

Semi-structured interviews, were conducted both before and after the workshops to gain information as to what parents saw as being necessary supports to facilitate their engagement in mathematics learning, and what activities from the workshops had been effective in achieving these aims. A researcher reflective journal was also used to gather data and monitor the success of the workshops as they progressed.

The study revealed that shared learning opportunities—involving both parents/whanau, students and teachers—can provide an effective means for: supporting parent understanding of current

approaches to teaching and learning in mathematics, provide better understanding of the language associated with the Numeracy Development Project and facilitate positive relationships between teachers and parents. Furthermore, adopting activities which model mathematics in everyday activities, similar to those in which families are involved, can act as an effective scaffold for parents to engage more effectively in mathematical discussions with their children in their own home and everyday setting. In addition, opportunities to watch teachers interact with students was found to be a powerful mechanism for parents to develop more productive communication strategies through which they could better support their children's learning.

## Acknowledgements

I would like to acknowledge and thank the many people who have contributed to this study. Without their support this project would not have been completed. Firstly, thank you to the parents who consented to participating in the research and who so willingly shared their perspectives and time. Your participation in this project has enabled me to better understand the challenges that you face in working with the school. As parents and teachers in your own right I have admired your patience and persistence and the commitment you have demonstrated in supporting your children's learning and achievement in mathematics. Thankyou also to the Principal, Deputy Principal and teachers who lent their time and expertise throughout the workshops, and who were open-minded and willing to support the aims of the project.

Secondly, I would like to thank my research supervisors for their guidance and support. Dr Glenda Anthony, to whom I am sincerely grateful for her encouragement and support throughout the process. Thank you for your availability to discuss the workshop programme and its design, for your guidance regarding how best to present the findings of this study, and for your unending patience and meticulous attention to detail in editing. I would also like to extend my thanks to Dr Jodie Hunter, my second supervisor. Thank you for your expertise and insight, your comments and suggestions have supported me to clarify my ideas and 'lift my game' ensuring that what has been presented has become something I hope others will find interesting and useful.

Also to the New Zealand Government, for providing me with a Teacher Study Award which has provided me with the time and resources to undertake this study.

Finally, I would like to acknowledge my family, my husband Rutu and my children Brittany, Zach, Sophie and Annelise, I love you and thank you for your patience and support throughout the many years of study. To my parents Paul and Raewyn, whose own 'funds of knowledge' contributed significantly to my education, and who always encouraged me to treat every opportunity as one from which I might learn something new. The learning never ends.

## Table of Contents

<b>Abstract</b>	i
<b>Acknowledgments</b>	iii
<b>List of Contents</b>	iv
<b>List of Figures and Tables</b>	viii
<b>Chapter One - Introduction</b>	
1.1 Introduction	1
1.2 Context	1
1.3 My interest in this research	2
1.4 Aims of the study	3
1.5 Overview of the Chapters	4
<b>Chapter Two – Literature Review</b>	
2.1 Introduction	6
2.2 Forming partnerships with parents	7
2.3 Factors influencing parent involvement	8
2.3.1 Role construction and parent expectations	9
2.3.2 Self efficacy	10
2.3.3 Invitations from the school and parent/teacher relationships	11
2.4 Historical approaches to parental engagement	13
2.5 Links to identity	14
2.6 Models of engagement	17
2.6.1 Extending ideas about partnership – funds of knowledge	19
2.7 Summary	21
<b>Chapter Three - Methodology</b>	
3.1 Introduction and overview	22
3.2 Qualitative Research	22
3.2.1 Educational Design Based Research	23
3.3 Researcher positioning	25
3.4 Participants and setting	28

3.5 Ethical considerations	29
3.6 Privacy and confidentiality	29
3.7 Data collection methods	30
3.7.1 Surveys	30
3.7.2 Interviews	31
3.7.3 Researcher reflective journal writing	33
3.8 Data analysis	34
3.9 Trustworthiness	35
4.0 Summary	36
<b>Chapter Four – Designing and enacting the workshops</b>	
4.1 Introduction	37
<i>Preparing for the workshops</i>	
4.2 Barriers to participation	38
4.3 Motivation to participate in the workshops	38
4.3.1 Sense of Responsibility	38
4.3.2 Knowledge about expectations for achievement	41
4.3.3 Understanding of current approaches in teaching and learning mathematics	42
4.3.4 An opportunity to upskill	44
4.4 Summary	44
<i>The Workshop Programme</i>	
4.5 Aims of the workshop programme	45
4.5.1 Getting underway – workshop one	46
4.6 Overview of the workshop programme, researcher reflections and design modifications	48
4.6.1 Design of problem solving activities	52
4.7 Supporting parents awareness of mathematics in everyday activities	55
4.7.1 ‘Maths in my Week’	56
4.7.2 Sharing opportunities for mathematics via Facebook	59
4.8 Summary	59
<b>Chapter Five – Impact of the Workshop Programme</b>	
5.1 Introduction	60
5.2 A new relationship with mathematics	61

5.3 Gaining confidence through understanding current approaches to teaching and learning	62
5.4 Supporting student learning through increased awareness of opportunities for mathematics in everyday activities	66
5.5 Supporting student learning through improved parent teaching capacity	69
5.6 Overall impact of the workshops in supporting parents' confidence to participate in mathematics learning	70
5.7 Parent-school partnerships	72
5.8 Summary	73
<b>Chapter Six</b>	
6.1 Introduction	75
6.2 Understanding barriers to participation	75
6.3 Motivation for participation	76
6.4 Increasing parent confidence – a new relationship with mathematics	77
6.5 Supporting learning through greater awareness of opportunities in everyday contexts	81
6.6 Parent perspective on opportunities for schools to provide support	84
6.7 Key findings	86
6.8 Limitations of the study and opportunities for further research	87
6.9 Concluding thoughts.	88
<b>References</b>	90
<b>Appendices</b>	
Appendix A: Pre-workshop questionnaire	94
Appendix B: Post-workshop questionnaire	97
Appendix C: Pre-workshop interview questions	100
Appendix D: Post-workshop interview questions	101
Appendix E: Information Sheet for parents'	102
Appendix F: Workshop Reflections	103
Appendix G: Information letter and consent	104



## List of Tables and Figures

Table 4.1	Overview of the workshops and summary of researcher reflections	48
Figure 4.1	Basketball Problem – Workshop 3	52
Figure 4.2	At the Lotto Shop – Workshop 4	53
Figure 4.3	How big is the Giant? – Workshop 6	54
Figure 4.4	The BFG – Workshop 6	54
Figure 4.5	Maths in my week – Workshop 2	56
Figure 4.6	Maths in my week – Workshop 2	57
Table 4.2	Parent references to everyday activities	58
Table 5.1	Response to questionnaire item: to what extent do you feel you understand current ways of teaching and learning in mathematics?	63
Table 5.2	Response to questionnaire item: I use everyday experiences to talk about mathematics with my child	68
Table 5.3	Response to questionnaire item: how much do you feel you are a part of your child’s mathematics learning?	68
Table 5.4	Usefulness of workshop activities	69
Table 5.5	Response to questionnaire item: I know how I can help my child with mathematics	71
Table 5.6	Response to questionnaire item: I feel confident about participating in mathematics activities with my child	71
Table 5.7	Response to questionnaire item: how important do you think your role is in your child’s mathematics learning?	72
Table 5.8	Response to questionnaire item: I think my helping makes a positive difference for my child	72