CLASSROOM SOUND FIELD AMPLIFICATION,
LISTENING AND LEARNING

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2007
Declaration

I hereby certify that the work embodied in this thesis is the result of original research and has not been submitted for a higher degree to any other University or Institution.

(Signed)
Acknowledgements

I am deeply grateful to Karen Pullar for introducing me to amplification systems, for challenging me to add to the knowledgebase on their use in educational environments, and for her availability as a supportive mentor.

I am especially grateful to Dr Rod Beattie who has guided me through the academic process of preparing and presenting my findings. I also acknowledge my intellectual debt to Kevin Heeney and Patsy Moy for their clarity and comments with the statistical information.

I thank the Oticon Foundation in New Zealand, the Rotorua Energy Charitable Trust and the University of Newcastle, for their grants that made this research possible.

The project was made possible with the cooperation of the five participating Rotorua school communities. I especially thank the teachers and the children and young people themselves. I acknowledge the driving force of Ray Howath of Westbrook School in establishing this cluster of schools.

I also acknowledge the guidance received from Ian Cocks of Van Asch Deaf Education Centre and the support of David Foster of Kelston Deaf Education Centre.

Finally, I thank Greig Lysaght for his support throughout this project.
Dedication

To the children and young people and the many colleagues who have contributed to my learning and teaching.
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Abstract

Sound field distribution is becoming increasingly known as a method to overcome problems associated with noise, distance, and reverberation in classrooms. No robust research on this intervention has been conducted in the New Zealand context. Changing pedagogies in the education of New Zealand children and young people have been observed particularly since the 1970’s, resulting in noisier classrooms (Wilson, 2000). Acoustic standards for New Zealand classrooms that were adopted in 2003 apply only to new or renovated classrooms, and not to the majority of existing classrooms (Ministry of Education, 2003a).

This study investigated: (a) the efficacy of sound field distribution in 30 New Zealand classrooms from five schools and compared outcome measures with a representative control group; (b) the variations of benefit for groups from specific populations, in particular children from five different socio-economic backgrounds and those with histories of middle ear dysfunction; and (c) the effects on teachers who use this equipment.

Data were collected from standardized objective measurement tools and from the teachers and students who were participating in the study.

Results revealed that sound field distribution, with the equipment configuration of boom microphones and four speakers, can enhance the
listening and learning environment resulting in significant positive benefits in raising the achievement levels of children and young people. These results were observed in listening comprehension, which has a flow-on effect on the overall scholastic achievement of all students. Evidence of improved outcomes in areas with a strong link to mastery of literacy were significant, in particular in the areas of phonologic skills, reading comprehension, and reading vocabulary.

Results of the study strongly support the use of sound field distribution in all mainstream school settings irrespective of whether the children and young people belong to a particular ethnic group, have had a history of middle ear dysfunction, or attend schools of a particular socio-economic status. Classroom sound field distribution seemingly benefits all children and young people.

As a result of the positive results of this study and given the stated goals for education by the New Zealand Ministry of Education (Ministry of Education, 2003b), sound field distribution needs to be considered at a policy level as an intervention to assist in reducing disparity and to improve learning outcomes for all young New Zealanders in mainstream school settings.