ENHANCING LITERACY LEARNING OUTCOMES FOR YEAR 1 CHILDREN

Project Plan

November 2014

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Contents

Executive Summary

The main goal of this literacy research project is to improve the literacy learning outcomes of New Entrant children during and beyond their first year of schooling. A particular focus is on children from lower decile schools, and children from Māori and Pasifika backgrounds.

These children have been the target of numerous government strategies, and they were identified as an area of concern in terms of inequitable schooling outcomes in the briefing papers prepared by the Ministry for the incoming Minister of Education following the 2011 general election.

To achieve this goal, we will work with teachers from randomly selected schools to introduce into their regular literacy classroom instruction additional supplementary strategies that emphasise the development of language-related and word-level decoding skills shown in research to be essential for successful reading acquisition.

While the focus of the research is on improving literacy learning outcomes for all children, especially those from backgrounds which are not adequately catered for in New Zealand's standard approach to literacy instruction, a professional learning and development (PLD) programme for teachers will be a key strategy for increasing literacy achievement.

The content of the PLD will be supplementary teaching strategies for enhancing literacy learning outcomes, along with the use and interpretation of additional assessments that effectively identify specific literacy learning needs that should be addressed during children's first year of schooling. A further key aspect of the PLD programme will be to encourage teachers to adopt *differentiated instruction* for New Entrant children.

This approach builds on the current use of reading groups that characterise New Zealand junior primary school classrooms. Specifically, differentiated instruction will be designed so that children's skill development on the literacy development continuum is taken into account. Some children will receive targeted language-related literacy instruction (e.g., phonemic and phonological awareness) whereas other children who already have basic reading-related language skills will receive instruction that recognises their different developmental progress.

An important aspect of the research project is the design. Having received agreement from Ministry of Education officials regarding the use of a comparison (control) group of schools and children (as well as approval from the Massey University Human Ethics Committee), we will provide a robust dimension to the study by having a crucial baseline benchmark against which to test the effects of the supplementary literacy instruction.

A further important aspect of the study is its longitudinal nature. Assessing the effects of the supplementary literacy instruction over a 3 year period will provide valuable information on the longer term results of this one year intervention with children in their Year 1 classroom.

Further, the study will make an important contribution to New Zealand research on literacy acquisition among young children. It will provide a rare, large-scale, longitudinal, mixed methods (quantitative and qualitative data) data set for informing theory, policy and practice.

Rationale

Introduction to the problem

The greatest challenge facing the schooling sector is providing equitable outcomes for students (Ministry of Education, 2011a). The unequal distribution of outcomes is illustrated in the PIRLS data (Mullis, Martin, Foy, & Drucker, 2012; Mullis, Martin, Gonzalez, & Kennedy, 2003; Mullis, Martin, Kennedy, & Foy, 2007) which show that differences in children's literate cultural capital at the beginning of school result in larger differences in future reading achievement among New Zealand children than in most other countries. Additionally, an analysis of Reading Recovery data for the previous decade has shown that a disproportionate number of Māori and Pasifika children receive Reading Recovery. More concerning is the larger number of Māori and Pasifika children who are not successfully "discontinued" from the programme (Tunmer, Chapman, Greaney, Prochnow, & Arrow, 2013a).

Strategies for improving literacy learning outcomes among Māori children, such as Ka Hikitea (Ministry of Education, 2013), Tātaiako (Ministry of Education, 2011b), and for Pasifika children in the Pasifika Education Plan (Ministry of Education, 2012), support the need for cultural responsiveness in the classroom. These strategies, however, cannot on their own, provide teachers with the knowledge required to effectively teach the content of the instruction that children who initially struggle with literacy acquisition require during their first year of schooling (see, for e.g., Tunmer, Chapman, & Prochnow, 2003). Teacher instruction depends on teacher knowledge, both in content and in pedagogy. Knowledgeable teachers who can implement effective methods of reading instruction have the potential to prevent reading failure (Moats, 2009; Snow, Griffen, & Burns, 2005). Teachers need research-based knowledge that enables them to implement instruction, to identify struggling readers, and to differentiate instructional needs.

Current literacy practices

Current literacy practices are based on a variety of Ministry of Education documents, including the *Effective Literacy Practices* handbooks (Ministry of Education, 2003, 2006). There are three threads to the literacy practices in New Entrant classrooms. These threads are relevant in all classrooms where children are learning to read print. The first thread is

the type of instructional approach, which refers to the context of the content instruction. The instructional approaches for reading that are most relevant in the beginning classroom are shared reading, guided reading, independent reading, and language experience. The second thread is a framework for literacy, based on three aspects of Luke and Freebody's (1999) Four Resources Model, which describes what happens when children are reading. These three components are 'learning of the code,' to 'make meaning' and to 'think critically'. The third thread is the "multiple sources of information" model of reading in which four primary sources of information are said to be important for all readers, including beginning readers, when identifying unfamiliar words in text. The four sources of *prior knowledge, semantics, syntax* and *grapho-phonic knowledge* are said to be used simultaneously by fluent readers. This model is also referred to as the 'searchlights model' and is largely discredited by contemporary research on reading acquisition (Stuart, Stainthorp, & Snowling, 2008).

It is possible that Luke and Freebody (1999) did not intend to equate making meaning with learning the code, however, the view that text meaning is paramount, and that teachers should not dwell on the detail of print (Clay & Cazden, 1990) has led to practices in which meaning or syntax is used as the basis for working out what a print word is, with no reference to letter-sound correspondences (see Ministry of Education, 2003 p. 38 for an example of this). This approach has also been influenced by the idea that children learn to read best when everything is in context (e.g., Ministry of Education, 1996, p. 33). The use of story and sentence context has been promoted as the main strategy for having children work out an unknown word in text, rather than having children learn the word level skills and strategies that are known to be essential for effective reading acquisition (see Tunmer, Chapman, Greaney, Prochnow, & Arrow, 2013b for a more extensive review).

In contrast to the prevailing practice regarding the use of context as a primary word identification strategy, the New Zealand Curriculum for English states that children will need to make connections between letters and sounds, and will slowly develop a sight-word reading vocabulary along with knowledge of text conventions (Ministry of Education, 2007). This explicit move to giving the 'learning of the code' a greater level of importance than previous Ministry of Education publications is highlighted by the inclusion of school entry foundational skills, such as "an awareness of rhyme", "distinguish some phonemes in spoken words", "be able to read their own names", "identify the first letter of their name", and, "write their name". Although these skills and types of knowledge are necessarily brief in the curriculum document, they are extended through the development of literacy learning progressions (Ministry of Education, 2010a).

The conflicting instructional guidelines have in some cases led to the misguided use of phonics programmes in isolation from text, with no integration back into the textual context in which they are best used. Evidence of such practices has come, initially, from ERO's review (Education Review Office, 2011) of literacy practices in early years settings which

indicate that some centres were applying various phonics and phonological awareness programmes in an *ad hoc* fashion. In addition, attempts to respond to student diversity by focusing on culturally responsive practices have resulted in a distorted focus on the approach to reading instruction rather than on the pedagogical content knowledge required for reading acquisition. Culturally responsive practice and appropriate skill-based content instruction are both required to derive the best outcomes (Au, 2007; Au, 2009)

Theoretical explanations

Learning to read, and the ability to derive meaning from text, requires an initial and specific focus on word-level print. The Simple View of Reading (SVR) framework provides a robust conceptual approach to understanding reading acquisiton that has been thoroughly researched for nearly three decades (Tunmer & Chapman, 2012a, 2012b; Vellutino, Tunmer, Jaccard, & Chen, 2007). The SVR model proposes that deriving meaning from text has two pathways: the decoding pathway, and the language comprehension pathway. Reading comprehension is seen as a product of the interaction between word level decoding skills and language comprehension skills. The SVR model is illustrated in Figure 1. In this illustration, we have added key prerequisite foundation skills known to be necessary for beginning readers to develop independent reading comprehension abilities. These prerequisite skills have also been referred to as *cognitive entry skills* (Tunmer & Nicholson, 2011).

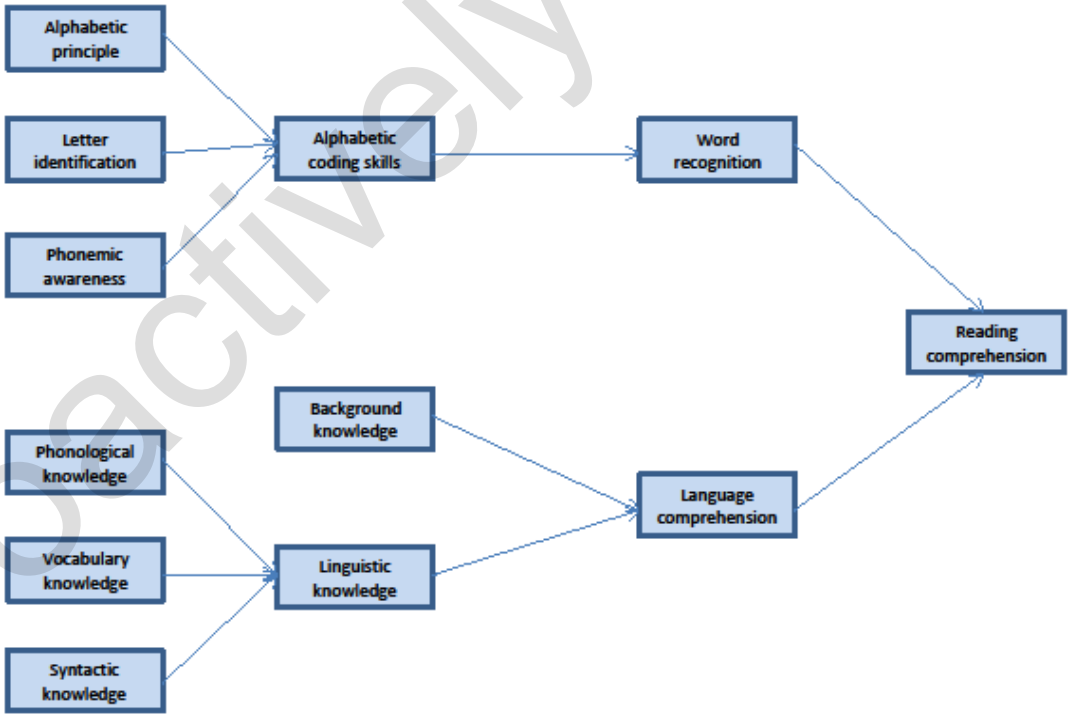


Figure 1: Simplified Cognitive Foundations of Learning to Read Model

An abundance of research shows that key cognitive entry skills include alphabet knowledge, primarily knowledge of the names of letters of the alphabet (Foulin, 2005); children's vocabularies which are facilitated through talk in the home (Lonigan, 2007; Snow & Beals, 2006); and phonological awareness, whereby children are aware of rhyming words and words that share the same onset (Arrow, 2010). Knowledge of the alphabetic principle refers to children's understanding that sounds in spoken words can be represented by letters in printed words (Moats, 2000). Other necessary, but not sufficient skills includes phonological knowledge, which involves the ability to distinguish between similar sounds (Wren, et al., 2000), syntactic knowledge and background knowledge to provide schema for the content of the text material.

Variation in cognitive entry skills at school entry provides initial differences in literacy learning outcomes (Tunmer, et al., 2003; Tunmer, Chapman, & Prochnow, 2006; Whitehurst & Lonigan, 2001). Many children commence school with high levels of the necessary foundations for learning to read and write. In general, these children flourish under a child-managed, meaning-focused instructional approach to literacy learning. Other children, however, have lower levels of these foundation skills and require greater amounts of teacher-managed, code-focused instruction (Connor, Morrison, & Katch, 2004; Connor, Morrison, & Underwood, 2007; Connor, et al., 2014). All children require and benefit from exposure to rich and varied literature, with a focus on deepening their vocabulary and comprehension (Pressley, Wharton-McDonald, Mistretta-Hampston, & Echevarria, 1998).

Differentiated instruction

Because beginning readers differ in the amount of reading-related knowledge, skills and experiences they bring with them on entry to school, their literacy learning needs will necessarily differ. As a result, children will benefit from differences in the degree and intensity of explicit instruction for learning the skills and strategies for identifying words and comprehending text. Children's location along the developmental progression from pre-reader to skilled reader will provide an indication as to the extent and intensity of explicit instruction that is most beneficial for each child (Arrow & Tunmer, 2012; Tunmer & Nicholson, 2011). Because of such differences, differentiated instruction from the outset of schooling is a powerful approach for accommodating the diversity of beginning readers, and for providing instruction that builds on what children already know when they start school (Arrow & Tunmer, 2012).

Children derive greater benefit from beginning reading instruction that includes explicit teaching of phonological awareness and alphabetic coding skills, outside the context of reading text, but in combination with plenty of opportunities to practice and receive feedback on using these skills during text reading (Connor, et al., 2009). This approach does not imply highly structured "phonics" programmes that are overly teacher-centred, or a curriculum that is rigid, fixed, and lock-step, with the same lesson given to every child. This type of structured programme would conflict with the basic principles of differentiated

literacy instruction. Rather, inclusion of phonics in initial literacy instruction is considered to be a means to an end, not an end in itself. For some children, a little bit of explicit phonics instruction will "go a long way" in helping them to progress along the path of becoming a skilled reader. Organising instruction to cater for the differing skill needs of new entrants is essential for maximizing the effectiveness of beginning literacy instruction (Juel & Minden-Cupp, 2000).

Teacher knowledge

Teachers cannot teach effectively when they have inadequate or incorrect knowledge of literacy development (Binks-Cantrell, Washburn, Joshi, & Hougen, 2012; Cunningham, Perry, Stanovich, & Stanovich, 2004). Unfortunately, many New Zealand teachers lack the understanding and knowledge that English is too complex a language structure for children to be able to induce all of the spelling patterns (Carroll, Gillon, & McNeill, 2012). Research clearly indicates that having children rely on strategies for inducing spelling patterns is ineffecient and unnecessary. Instead, explict instruction in letter-sound correspondences and patterns provides for a much more effecient and effective approach to literacy instruction in English.

In this research project, teacher professional development will be directed towards developing in teachers a high level of the teacher knowledge that is required for effective teaching based on children's location on the developmental continuum. Teacher knowledge of English orthography and morphology can help teachers move beyond the limitations of a phonics programme (Snow, et al., 2005). It is also important for teachers to develop their knowledge of word level skills so they can incorporate the teaching of these skills into their existing programme. When the rules for word decoding and and word spelling are understood, it is easier to work with children to learn these essential skills (McNeill & Kirk, 2013). Children who do not acquire an understanding of these rules, either implictly or through explicit teaching, start to lag behind in their literacy development, and they become reliant on identifying unfamiliar words in text by guessing or using non-text cues (e.g., illustrations). It is these strategies that characterise poor readers (Nicholson, 1991; Nicholson, 1993; Pressley, 2006).

Conclusion

This project aims to extend current literacy practices in New Zealand classrooms by using contemporary research on children's reading acquisition to implement effective methods of teaching to address the achievement disparities that occur at the outset of school entry. Our goal is to trial an approach to literacy teaching in which all new entrants, regardless of school entry reading-related knowledge, skills, and experiences, will have an equal chance of success in learning to read (Tunmer, et al., 2013b). Rather than making assumptions about each child's entry skills and knowledge, we will specifically assess those foundational skills and knowledge that are known to be essential for effective reading acquisition. Instruction can then be adjusted to suit the needs of each child (Arrow & Tunmer, 2012).

Research Questions

The goal of this literacy research project is to improve the literacy learning outcomes of children who may not otherwise be successful in literacy learning, while also extending the achievement levels of children who are already successful. To achieve this goal the research will trial a teaching approach that supplements existing practice in New Entrant classrooms. This teaching approach is based on research evidence and current reading theory, and will be implemented by classroom teachers. The teachers will be supported by participating in a professional development programme that encompasses the most up-to-date research on how children develop their literacy abilities as well as an assessment approach that provides information on children's key language- and reading-related skills.

The model of reading development and its component skills (see Figure 1), and its associated assessment framework (described in the Child assessments section), are used to identify the key literacy abilities that children need to learn at the outset. These literacy abilities and their associated assessment tools have been used in small scale research projects in quasi-random intervention programmes. To date, however, there appears to have been no research on the learning of the abilities, the assessment of them, and the associated teaching content knowledge, in large-scale random allocation research in New Zealand. This research project will provide the pedagogical content knowledge for teachers to use in classroom-wide instruction as well as in differentiated instruction.

The specific research questions are listed below.

1. Will Year One children in the intervention classrooms show increased literacy gains at the end of their first year in school compared with children in the comparison classrooms?
2. Will increased literacy gains continue through to the end of Year 2 and Year 3 for those children in the intervention classrooms compared to those in the comparison classrooms?
3. Will increased literacy gains for children in the Intervention classrooms be associated with more positive self-system variables, such as reading self-efficacy, compared to children in the comparison classrooms?
4. Will the literacy intervention show greater gains for children from low decile schools and for Māori and Pasifika children compared to children from higher decile schools and from Pakeha backgrounds, and to children similar schools and backgrounds in the comparison schools?
5. Will teacher knowledge of supplementary word-level decoding teaching strategies and teacher confidence in teaching beginning readers increase among those teachers who receive the professional development programme compared to teachers in the comparison group?
6. To what extent can intervention schools' senior leadership teams provide and sustain the conditions required for student achievement and teacher capability?

Research Design

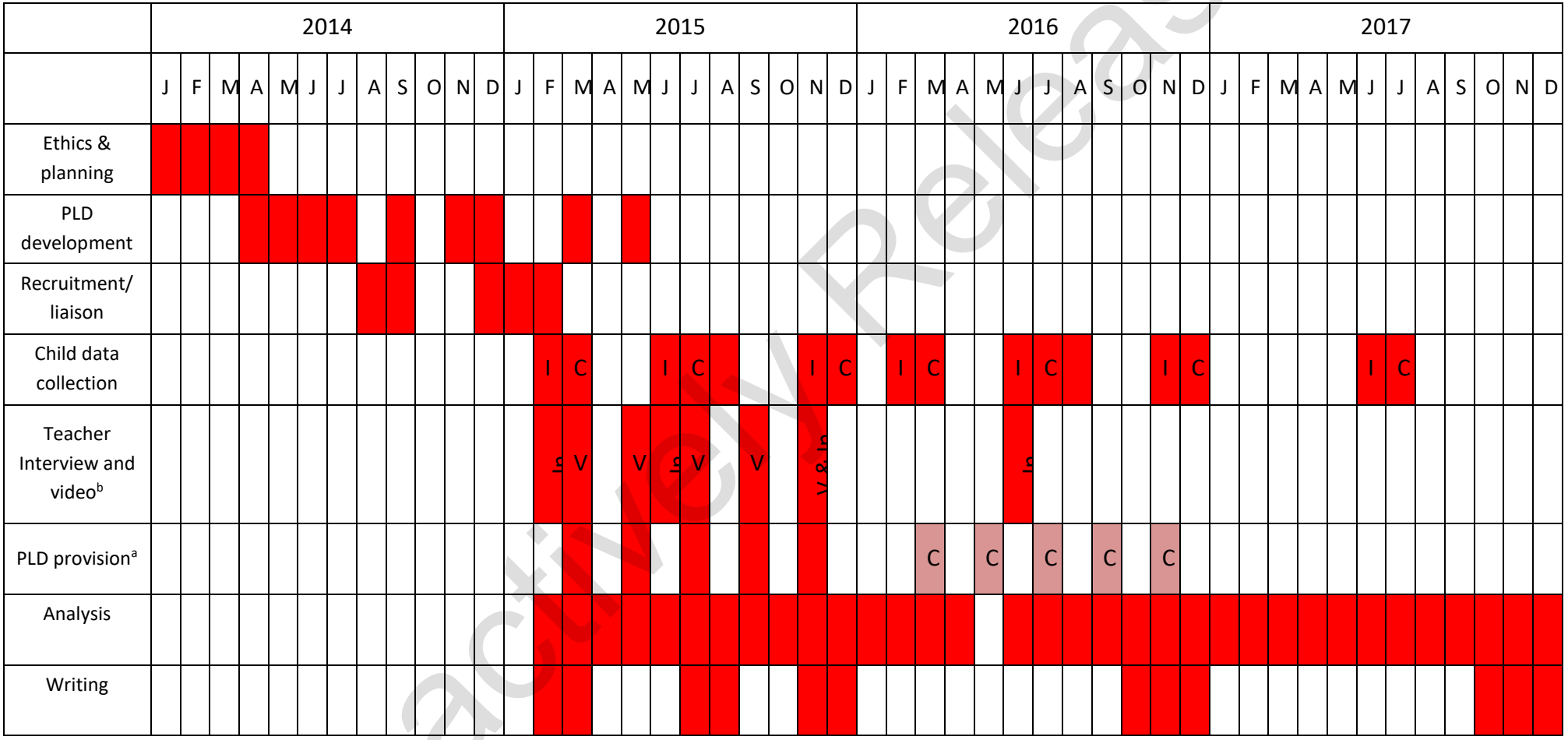
This study involves a mixed methods randomised control study with a longitudinal component. In line with recent recommendations of the Chief Science Advisor to the Prime Minister (Sir Peter Gluckman), we have opted for a randomly selected number of intervention schools, and an equal number of randomly selected comparison schools. The aim is to have similar numbers of New Entrant 5 year old children in each of the two samples, and an approximately equal number of teachers.

The intervention will occur during Year 1 for those New Entrant children who are in the schools that are randomly selected for participation in the study. The teachers of these children will participate in workshops during the latter part of 2014, to prepare them for introducing supplementary literacy instruction strategies with New Entrant children from the start of the academic year in February 2015. Teachers and New Entrants in the comparison schools will continue with their normal literacy programme and literacy instructional practices, but assessments will be undertaken to provide points of comparison with children and teachers who participate in the intervention programme.

Qualitative data will be collected by way of questionnaires and interviews with teachers, and by means of a literacy home background survey. Literacy assessment data will be collected from children at specified times during Years 1, 2 and 3. These ongoing assessments will provide information in regard to the predicted literacy gains made by children in the intervention schools compared with those in the comparison schools. The large sample size will enable sophisticated statistical analyses to be undertaken, which will provide important information on the effectiveness of the supplementary literacy instruction strategies as well as the predictive validity of key language-related pre-reading skills.

Teachers in the comparison schools will be offered the chance to participate in a PLD programme during the second year of the study. This provides another source of evidence regarding the effectiveness of supplementary literacy instruction strategies. An outline of the design is illustrated in Figure 2, with a more detailed timeline in Table 1. To identify the influence of the instruction on the literacy achievement outcomes of beginning readers, all children in both the intervention and control schools will be assessed on the school entry skills identified in the measures section of this document (see Table 2). In addition, parents will be asked to complete a home literacy environment survey adapted from the PIRLS home literacy survey (Mullis, et al., 2012). Teachers will be asked to complete a short behaviour checklist for each child, adapted from the Connors teacher rating scale (Connors, 1997). These initial assessments will enable us to better understand home background influences in relation to literacy acquisition, and also classroom behaviours that are associated with literacy learning outcomes.

Table 1: Project timeline 2014-2017



[a]Exact times of the PLD provision will depend on the school selection process. It is expected that individual workshops will be spaced 5-6 weeks apart, excluding school holidays.

KEY: I = Intervention; C = Control; O = Observation; In = Interview; V = Videotaping

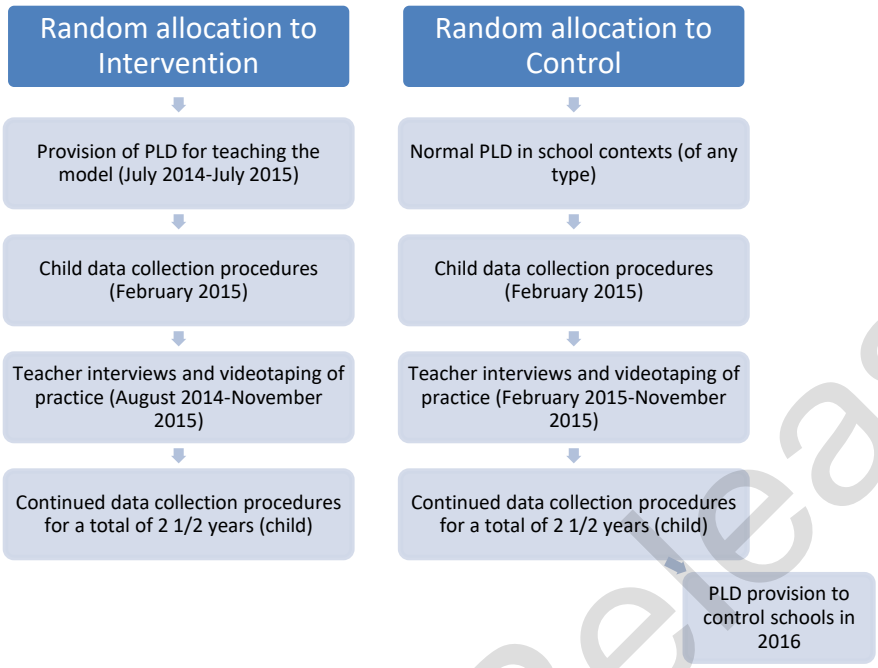


Figure 2: Basic design of data collection procedures

To follow literacy achievement, literacy assessments will be conducted every three months, with a six month gap prior to the final assessment time in July 2017 (see Table 1). Challenges to the integrity of the research design, and the method of addressing those challenges are given below.

- *Attrition.* There will be attrition of children across the sample, although attrition rates are likely to be higher in the lower-decile strata of the sample. The sample size has been set to take into account attrition over the three year period of the data collection. In addition, oversampling will occur in the lower-decile strata to maintain sufficient numbers over time.
- *Teacher attrition.* It is recognised that it is likely that teachers will move on from the school between the beginning of the provision of the professional development and the end of the first year of school for students. As with student attrition, the sample size has been set at a level to account for attrition of teachers.
- *Teacher – student stability in year one.* In the first year of the project the assumption is made that children will remain in the same classroom with the same teacher. Normally, not all schools will set up their school entry procedures in that way. To address this challenge we will ask schools to ring-fence that teacher and set of children for the school year. Additional children can come into the classroom, but we would like our target New Entrant children to remain in the classroom for the year.
- *Researcher bias*. To reduce researcher bias towards outcomes we will be using blind procedures. The research assistants collecting child data will be asked to not discuss

the experimental condition that the school sits within. All incidents resulting in the research assistant being no longer blind to the condition the school sits within will be recorded and carefully monitored by the investigators.

- *Other literacy initiatives in schools*. It is recognised that schools may be using supplementary literacy inititives and programmes. We will record references to clearly identified initiatives or programmes. Once these are identified they can be statistically controlled for.

Procedures for participant selection

The research design specifies that this research sample be selected as clusters (school level) in a random-selection procedure. This means that both the intervention sample and the comparison sample are randomly selected from the population of schools in the lower North Island, with the assumption that the two resulting samples are each representative of that population. To obtain sufficient statistical power and meaningful effect sizes, the sample size has been set at up to 40 schools in each of the intervention and comparison conditions. The cluster is set at the school level, with the expectation that there will only be one teacher from each of the schools in the sample. At the individual level we expect between 11 and 20 children from each school to be included at each cluster, with the lower number the minimum we have set per cluster. Thus, the maximum number of possible participant teachers is 80, and the maximum number of possible child participants is 1600. However, the number of child participants is likely to be closer to 1200, based on an average number of 15 children per school.

To carry out the randomised selection procedures the entire population of lower North Island schools which enrol new entrants, were ranked by number of New Entrants enrolling at the start of the school year in 2013. The schools were then grouped into clusters of decile level: 1-3, 4-7, 8-10. It is expected that 10% of schools are classified at each decile level. The ideal sample would be to have equal representation of each decile level. However, in this project the overall aim of the research is to improve literacy outcomes for those most at risk. Accordingly, oversampling occurred in the lower-decile range (38% of the selected sample), and undersampling in the highest-decile range (28% of the selected sample).

Within each decile cluster, schools that enrolled less than 14 children were deleted, with the exception of the decile 1-3 cluster. In that cluster the number of possible schools was lower than the set level of representation, thus the cut-off for student enrolments was set to 11. This procedure led to all schools in the decile 1-3 cluster being included in the sample. For the other two decile clusters, random sampling of a set number was used to select the specified percentage of schools. Half of the randomly selected schools in each decile cluster (all schools in the lowest cluster) were randomly selected as intervention or comparison, using random selection procedures for 50% sample selection for each decile cluster as intervention and the remaining schools as comparison. The principals of all selected schools

will be invited to participate in the study. They will be asked to discuss the project with their junior school leadership team and the teacher of the first intake of Year 1 students in Term 1 of 2015. The research project team will follow up with schools to find out if the teacher is willing and the school is able to ensure the teacher will teach that group of children throughout the whole of the school year.

The intervention school teachers will then be asked to begin the professional development programme from July 2014 in preparation for the full use of the additional instruction with the sample children in 2015. Schools will also be asked to assist in providing information sheets and consent forms to the expected students of the teacher through their normal enrolment processes. This will be followed up by the principal investigators or the associate investigators.

The research is designed for first language or fluent English speaking children. We may exclude from data analyses those children for whom Engish is not their first langauge and who are not yet fluent in English. No child will be aware that their data may not be included in the analyses, therefore there will be no negative impact of this study on their literacy programme. That said, the instruction is expected to meet the needs of ESOL students by recognising that there are often similarities across languages which can be drawn on to make connections (McBride-Chang, 2004).

Assessments and measures

The assessments and measures take three forms. The first assessment set consists of those that are derived from the assessment framework, and will be administered by research assistants. The results will be shared back to classroom teachers. These assessments identify the abilities and needs of children according to the reading development framework (Figure 1). The assessments are described under subheadings relating to the aspects of the development framework, with the specific framework links given in Figure 3 and Figure 4. The assessments will be assessed only on those forms of knowledge that are appropriate for their developmental progression, as indicated in the development framework. Table 2 provides the timeline for these assessments, illustrating how the more difficult tasks that have assumptions of higher levels of reading ability will be assessed at the appropriate developmental time points. The assessment data specific to learning and teaching will be shared back to teachers. The intervention teachers will receive these data through the PLD programme, and regular instruction comparison teachers will be provided with the data for their own exploration and use.

The second assessment set consists of the assessments that are necessary to ensure that as many possible influences are measured, and thus can be statistically controlled for when examining the effect of the literacy instruction added to the literacy programme. Behaviour

and home literacy experiences will be taken into account in terms of their influence on individuals and at the classroom or school level.

The last assessment set comprises measures relating to instructional fidelity and teacher confidence in providing the supplementary instruction. As with the child data, all teachers, from both intervention and comparison schools will take part in these assessments. This is particularly important to ensure that the teachers in the intervention schools are implementing the instruction as intended, and to identify the potential influence of other literacy initiatives in comparison schools.

Child assessments from the assessment framework

Letter identification

Historically, letter name knowledge and letter sound knowledge have been assessed as part of the same knowledge, as in the way letter knowledge is assessed in the Observation Survey (Clay, 2002). However, research indicates that although highly correlated, at the initial stages of learning to read these two aspects of letter knowledge differentially predict pathways to new word learning (Arrow, 2012). In this assessment framework they have been separated out accordingly. In addition, although many 4 year old children know at least a few letter names, some children do not know any letter sounds (Arrow, 2010; Arrow & McLachlan, 2014). Ceiling effects mean that letter name knowledge would be assessed only at time 1 and time 2. The Literacy Learning Progressions (Ministry of Education, 2010a) state that children are usually expected to know all letter names by the end of Year 1.

Knowledge of alphabetic principle

Letter-sound knowledge is used to assess knowledge of the alphabetic principle, as illustrated in the development framework. Letter-sound knowledge draws on the realisation that print (in this case letters) represents sounds. As some letters represent several sounds (e.g., *A* represents the different sounds of /ā/, /ă/, /ŭ/) so it is necessary to recognise those different possibilities as being correct as well. The need for letter sound knowledge is identified in the Literacy Learning Progressions for the end of Year 1 (Ministry of Education, 2010a). Letter sound knowledge also has a ceiling effect and so will only be assessed at time 1 and time 2.

Phonemic awareness

Another of the precursor skills for decoding words is phonemic awareness. Phonemic awareness refers to the metacognitive ability of being able to identify and manipulate sounds in words. Within phonemic awareness there is a developmental progression from being able to identify initial sounds to being able to manipulate sounds from the middle of words (see Gillon, 2005 for more on this) Phoneme awareness is an ability identified as necessary in the Literacy Learning Progressions for the end of Year 1 reading (Ministry of Education, 2010a). Preceding phoneme awareness is rime awareness, where children can identify and manipulate the part of words that make them rime (e.g., the /at/ in CAT).

Although a majority of children can do this by school entry a number cannot (Arrow, 2010). Thus, this ability must also be assessed to ensure that the level of knowledge is assessed to enable the appropriate attention be given to it in the classroom. In this project the Phonological Abilities Test (Muter, Hulme, & Snowling, 1997) will be used to assess rime and early phoneme awareness. This test has a ceiling effect by the end of the first year of school, thus it will be supplemented with a test of phoneme segmentation ability. Phoneme segmentation is a measure of phoneme manipulation used to assess later phonological awareness abilities. It is also necessary for being able to segment the individual sounds to spell, as indicated in the Literacy Learning Progressions for the end of Year 1 writing (Ministry of Education, 2010a).

Vocabulary

The British Picture Vocabulary scale (Dunn, et al., 2009) will be used to asses receptive language abilities at time one and at time six. Receptive language ability refers to understanding the meanings of words, necessary for the production of functional language (also refer to Ministry of Education, 2009a for an extended discussion on the value of vocabulary knowledge). Vocabulary will be assessed again at time six to examine the possible vocabulary added-value gain of children through increased reading and an emphasis on vocabulary as they most important predictor of literacy development (Hart & Risley, 2003).

Syntactic knowledge

Mispronunciation correction and oral cloze task: This task will examine syntactic knowledge (Tunmer & Chapman, 2012a; Tunmer, et al., 2006), but also provides an indication of how children make use of their vocabulary knowledge to make of decoding approximations. The oral cloze task requires children to complete orally presented sentences with the appropriate word. The mispronunciation task asks children to correct a mispronounced word provided in a sentence context, with semantic and syntactic cues.

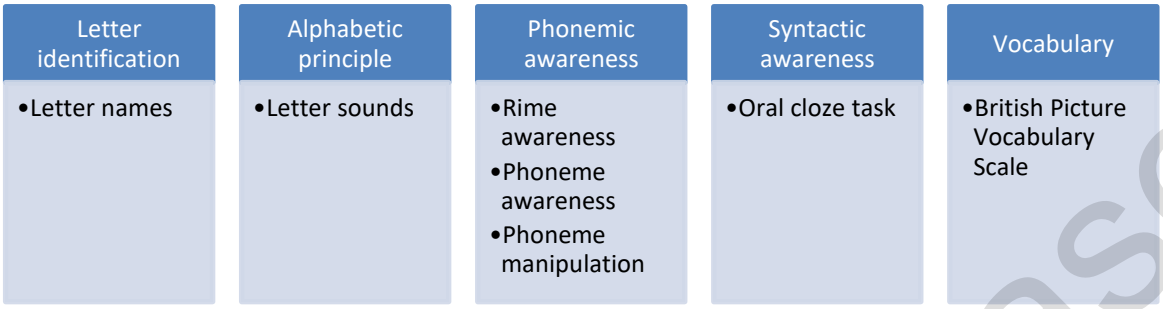


Figure 3: Skills assessed early in the assessment framework

Alphabetic coding skills

Alphabet coding skills refers to skills and knowledge that children must acquire to enable to them to begin reading and spelling unknown words. The skills and knowledge range from knowledge of word components (blends, digraphs, morphemes) to the explicit and implicit application of that knowledge to reading and spelling. Accordingly, there are a number of assessments for this. As the development of these skills and the application of them are predicated on developing the previous abilities they are assessed from time 2 onwards.

Blends and digraphs: Beyond knowing the sounds of letters children must develop the ability to quickly recognise chunks of words to use in reading words. Those learned after individual letters are consonant blends and consonant digraphs (e.g., Ehri, 2014). These will be assessed at time 2 and 3. The time 3 measure will have vowel digraphs added. Blends and digraphs are necessary for effective reading and spelling by the end of year 1 and the end of year 2, as recognised in the Literacy Learning progressions (Ministry of Education, 2010a).

Spelling: Spelling demonstrates the knowledge children have of how words are constructed. Spelling ability provides a window into children's ability to hear sounds in words and into their knowledge of orthographic patterns. (Ehri, 2000). Assessing spelling enables the assessment of the application of spelling patterns to sounds, and the progress towards applying the patterns in ways that are orthographically legal. The time one and two spelling task uses a small number of short words that have high frequency in oral language. While the research team will score this in quantitative ways, teachers will be able to use the data to analyse needs of students in terms of spelling patterns known and not known. The need

to recognise and use these patterns is indicated in the Literacy Learning Progressions for Years 1, 2, and 3 (Ministry of Education, 2010a). Later spelling assessments will be carried out with a standardised measure of spelling, the WRAT-4 (Wilkinson & Roberston, 2006)

Pseudoword reading: Pseudoword reading refers to the reading of words constructed to assess children's ability to decode using the patterns of English. It requires the recognition of orthographic spelling patterns (or even letters alone) and the ability to apply phonological sounds to those, followed up by the blending of those sounds into words. This measure is used to assess the strategies children use when trying to decode a word as well as how they can apply sounds to spelling patterns (McKenna & Dougherty Stahl, 2009). The task will be carried out at times 3, 4, and 5, as these are the points in the average child's development where they are required to begin using their knowledge and strategies independently of teacher support. Both the knowledge and the strategy use assessed with this task are identified within Years 1, 2, and 3 in the Literacy Learning Progressions for Reading (Ministry of Education, 2010a).

Strategy: This measure of strategy use, outside of the act of decoding or spelling, taps into children's metacognitive awareness of what they do when they are reading or spelling. This short task consists of two questions. The first is: "what do you do when you come to a word you can't read?" The second is: "what do you do when want to write a word but can't spell it?" Previous research has found that children who are achieving in reading will mention the use of letters for reading, but children who are having difficulty with reading will mention the use of context cues (Tunmer, et al., 2006). In this research, the aim is to have all beginning readers make use of the letters in words to attempt the initial decoding, as good readers do, followed by the use of context cues (Tunmer & Chapman, 2012a). This strategy is also described in the Literacy Learning Progression in the first year and across the following years (Ministry of Education, 2010a). This task will be carried out at time 3 and at the final two time points.

Word recognition

Word recognition refers to the fluent, rapid reading of words as they appear. The words read in this way are usually known as sight words. Sight words are not just the high-frequency words that children learn to read first, but the term is used to describe any word read with automaticity (Ehri, 2014). This automatic word recognition is expected of children by the end of the first year of school (Ministry of Education, 2010a). Word recognition can also capture children's implicit decoding abilities applied to unfamiliar words.The measures can also identify children's alphabetic coding skills for increasingly difficult real words, including their application of syllables and morphemes to decoding strategies. As children can begin developing sight word knowledge prior to beginning school, early word recognition will be assessed at times 1 and 2 using one of the Ready to Read test lists (Clay, 2002). From time 3 onwards word recognition will be assessed by the Burt Word Reading

Test (Gilmore, Croft, & Reid, 1981) for single word reading. This test can capture word recognition abilities up to the age of 12.

Language comprehension

Language comprehension broadly encompasses both vocabulary and syntactic awareness, but it also includes phonological knowledge and background knowledge. Phonological knowledge is implicit in oral language use as it refers to the ability to distinguish between similar sounds in speech. In English, this can include being able to distinguish between the sound of /p/ and the sound of /b/ (Moats, 2000). Background knowledge includes what children know, their developed schema, the ability to make inferences, knowledge of pragmatic rules and formal uses of language, such as perspective taking (Snow, et al., 2005). All of these are also required for reading comprehension, but this contributor to reading comprehension is outside of the requirement to also decode. Thus, language comprehension assesses the ability to make meaning and to think critically without the act of reading. A listening comprehension measure will be used to assess language comprehension. In this research, project parallel forms of the NEALE analysis of reading (McKay & Barnard, 1999) will be used.

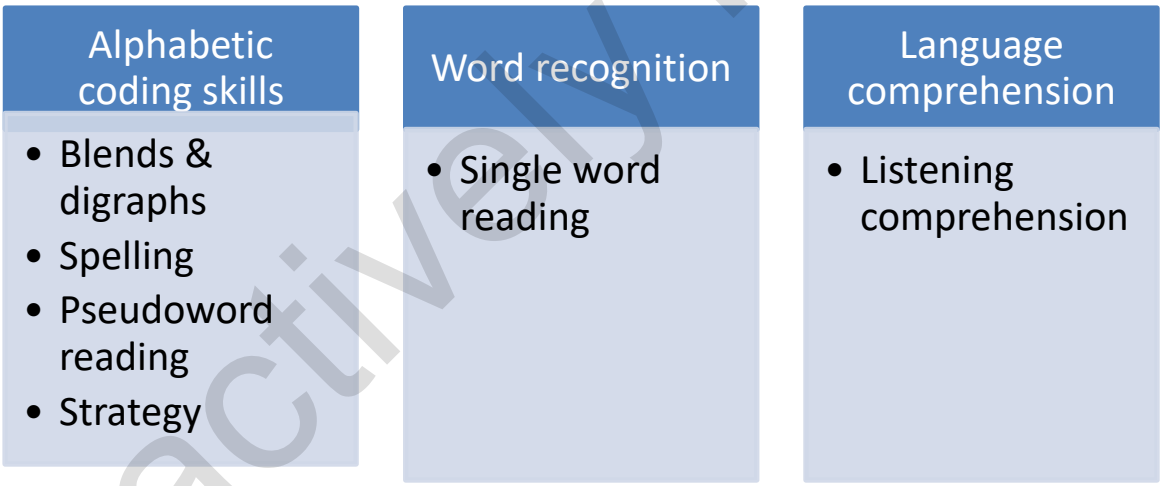


Figure 4: Word-level and language comprehension in the assessment framework

Reading comprehension

As the ultimate goal of reading instruction, the comprehension of text is assessed only in the final two time periods. Although children develop comprehension knowledge and strategies alongside decoding, it is not until decoding is efficient that reading comprehension itself can be validly assessed (Tunmer & Chapman, 2012b). Reading comprehension ability at the final time points dovetails with the requirements for Level One English in the New Zealand

Curriculum (Ministry of Education, 2007). By making use of the preceding skills and strategies children will be able to meet the requirements of *purposes and audiences, ideas, language features* and *structure*. In this research project reading comprehension will be assessed using the NEALE analysis of reading, which comprises of a series of texts of increasing difficulty with comprehension questions, also of increasing complexity (McKay & Barnard, 1999).

Relationship to National Standards

Although the direct relationship to National Standards for reading and writing (Ministry of Education, 2009b, 2010b, 2010c) is not mentioned in the above assessments, the research project is based on the premise that the assessment and instruction in the skills and strategies in the assessment framework will directly contribute to the achievement of National Standards. It is anticipated that children will make use of the skills and strategies to read to the required level. The decoding abilities, in turn, will enable children to have enough cognitive capacity to respond to and think critically about texts.

Child assessment measures not in the assessment framework

Self-efficacy: This task consists of five questions relating to reading self-efficacy that the researcher will read aloud to the child. Self-efficacy measures personal agency in being able to reach a desired achievement outcome by employing specific strategies. Self-efficacy is an indicator of motivation, and its assessment in this project will be used to examine the self-confidence of children who have received the intervention instruction, compared to those who have not. Pilot testing indicates that this is not appropriate for school beginners but will be used when children are older, from time 3 onwards.

Behaviour checklist: Children's behaviour can affect their own learning, but also the learning opportunities of others in the classroom. To ensure that classrooms that have children with behaviour difficulties are identified and sufficiently taken into account, teachers will be asked to completed a behaviour checklist for each child participant after teaching them for more than two weeks. This checklist is adapted from the Connors Behaviour Checklist and the revised version adapted by Purpura and Lonigan (2009). Each child's Year 2 and 3 teachers will also be asked to complete the checklist to enable us to examine any changes in behaviour as they relate to reading achievement.

Home literacy survey: Children's home literacy environments can influence literacy development (Burgess, 1999; Tunmer, et al., 2006) through the amount and nature of literacy interaction children have before beginning school, as well as once they have started school (McNaughton, 1995; McNaughton, 2001; McNaughton, Amituanai-Toloa, & Wolfgramm-Foliaki, 2009). By collecting information on home literacy background, the influence of home literacy environments can be better understood in terms of the influence

on later learning. Parents and caregivers will be asked to completethe home literacy questionnaires and return them to the classroom teachers. The survey will seek information about the amount of reading at home, who reads, visits to the library, as well as the use of digital technology, specifically educational media. The checklist is adapted from the PIRLS home literacy survey (Mullis, et al., 2012).

Classroom and teacher measures

Teachers in both the intervention and comparison groups will take part in the following activities.

Classroom observations: Classroom observations will be undertaken with all intervention and comparison school teachers. These observations will take the place of self-videoed literacy instruction, five times over the first year for the comparison school teachers. Intervention school teachers' will generate videos two times in 2014 to use in the second and third workshops, as described in the intervention section. For continued fidelity they will also be videoed five times in the first full year of the implementation (2015) in addition to the three in 2014. The research project team will code the videos for instructional behaviours for intervention instruction programme fidelity, and to identify comparison group teachers who may be independently providing instruction that is similar to that being used in the intervention schools. The comparison group teachers will have videos returned to them to use for their own self-review, as will the intervention teachers for the last three videos in 2015.

Teacher surveys and interviews: Teacher surveys will be carried out to identify what they consider to be key issues in literacy development for New Entrants, reflections on practice and their own knowledge growth. The interviews will also ask about other literacy programmes that the new entrant and year one teachers have been using in their school. The key data from the surveys and interviews will be to examine growth in teacher knowledge, teacher self-efficacy in teaching word-level skills to students, and success in the implementation of the supplementary programme. These interviews will include questions for intervention teachers that will examine what senior leadership teams have provided in terms of resourcing to enable teachers to develop their capabilities in providing the supplementary programme.

In addition, the interviews will be used to provide guidance to the research project to improve the professional development programme to allow for the scaling up of the project in the future. The interviews with intervention teachers will make use of the Concerns-Based Adoption Model (CBAM, Hall & Hord, 2005) levels of concern to monitor the implementation and to make improvements that based on information provided in the interviews. The end of each module will also include a survey for intervention teacher, to

determine how the teachers feel about the programme implementation. This will be in the form of an electronic survey.

School leadership team members

School leadership teams will be surveyed to further investigate the nature of strategic resourcing in early literacy, and for intervention schools, the programme implementation itself. This will be carried out using electronic survey methods.

Table 2: Timeline and identification of task at each child assessment data time point

Task	T1	T2	T3	T4	T5	T6	T7
	February 2015	July 2015	November 2015	March 2016	July 2016	November 2016	July 2017
Letter Names	■	■					
Letter Sounds	■	■					
Blends/Digraphs		■	■				
PA Rime awareness	■	■					
PA Phoneme awareness	■	■					
PA Blending	■	■	■	■			
PA Segmenting		■	■	■	■		
Pseudoword Rdg			■	■	■		
Invented spelling	■	■					
WRAT spelling			■	■	■	■	■
Clay reading	■	■	■				
Burt reading			■	■	■	■	■
Vocabulary	■					■	■
Neale Listening					■	■	■
Neale Comprehension					■	■	■
Syntactic knowledge		■		■		■	■
Self-efficacy			■			■	■
Word Strategy			■			■	■

The Professional Learning and Development Programme

Overview

The professional development programme is the vehicle for providing the literacy instruction that is central to the research project. The PLD programme is intended to provide research-based strategies for teachers to supplement instruction in their existing literacy programmes; it is not designed to be a replacement programme. Teachers in the intervention group will be asked to attend five workshops on how to teach word-level skills to beginning readers, supplementing the teaching content and the existing approaches in use. In between workshops, an online interactive forum site will be active, enabling the teachers to share ideas and strategies. Ongoing teacher surveys and surveys with intervention teachers taking part on the PLD will be used to identify levels of concern of participants that will contribute to ongoing review and iterative improvements.

Generally the PLD programme will take the following form:

1. Initial day (2-days for module 1) workshops for teachers. Across the modules the workshops will elaborate on three themes: extending teacher knowledge for the module content; assessing and analysing assessment data; and, ways of teaching content knowledge to students.
    a. The assessment data used in the modules will have been collected and provided to teachers.
    b. The teaching practices will involve teachers making use of video of their own practice, analysing the material terms of new content knowledge and identifying new approaches or responses to students.
2. Use what was learnt for teacher inquiry into the individual learners in their classrooms. There will be specific goals for inquiry using case study data for individual students. These goals will be shared through the online communities. In the online community there will be access to all workshop resources and guides. The PLD facilitators will also be active in the online community for support and guidance.

Principles underpinning PLD provision

This PLD programme is based on five key principles of effective instruction, derived from theory and research on cognitive learning: direct instruction, co-construction, active learning, scaffolding and modelling (Bjorklund, 2005). The workshops and module content will be developed in terms of direct instruction. The direct instruction will consist of the provision of content knowledge that teachers of New Entrant or Year 1 children need to teach literacy in ways that address the needs of all children. The PLD will take the form of a professional coaching and mentoring programme that is aimed at enhancing teaching effectiveness, making use of teachers' experiences for the active learning to take place.

The information collected will include children's assessment data and video of teaching and learning moments collected specifically for the teachers to analyse as well as to provide baseline information for comparison later in the programme. The examination and use of these data will operationalise the principle of active learning, to make the connections, or bridges, from the content being provided through the professional development to the actual data itself. This is where the implementation fidelity measures are focused; on the application of what is learned in the PLD to the literacy programme in the classroom.

In terms of the principle of co-construction, this concept is operationalised through the establishment of clusters where teachers will be supported to interact and participate in collegial and professional learning opportunities. The clusters will provide a safe forum for critically examining the effect of intended and unintended changes, with the aim being to plan for future change and transformation in teaching practice. The clusters and communities of practice will be regionally based and will occur both physically, in the workshops, and also in online communities through the website developed for the modules and forums. Modelling will take place within the mentoring, and will be embedded within the workshops. The PLD facilitators will use video and role-play to model effective practices and use of data for planning.

Finally, scaffolding is illustrated in the nature of the content of the modules. The modules will be carefully developed to build on one another in terms of content knowledge for teachers. They will also reflect the developmental progressions that children make in their literacy learning. Thus, teachers will be learning the content and making use of it for practice, at the same time as children are learning. The final module pulls all content together to provide a coherent series of modules based on content-based knowledge and learning. The CBAM intervention model (Hall & Hord, 2005) is used to monitor the effectiveness of the implementation as well as to identify concerns.

The intense nature of the PLD is supported by the research reviewed by Darling-Hammond and Richardson (2009). They argue that PLD should be content-based, include active learning through practice and reflections, and be collaborative and collegial. In addition, Darling-Hammond, Chung Wei, Andree, Richardson, and Orphanos (2009) illustrate that programmes which include the above elements have positive outcomes for children when they run from 30 to 100 hours, over a 6 to 12 month perido of time (see also, Biancarosa, Bryk, & Dexter, 2010; Chappuis, Chappuis, & Stiggins, 2009; Neuman & Wright, 2010).

Module rationale

The modules are developed to correspond with the developmental nature of reading, as illustrated in the Simplified Cognitive Foundations of Learning to Read Model (Figure 1). Figure 5 illustrates the content of the first four modules as they relate to the Learning to Read Model, the assessments from the assessment framework outlined in Figure 3 and 4, and frequently used assessments in New Zealand schools. The final module is different in that it draws the content of the previous modules together to cover how differentiated

instruction can be implemented in the classroom. This module will also draw on the participants' experiences in applying the teaching approaches covered in the previous modules. More detailed module outlines are provided in Appendix 1, noting that these are constantly under review.

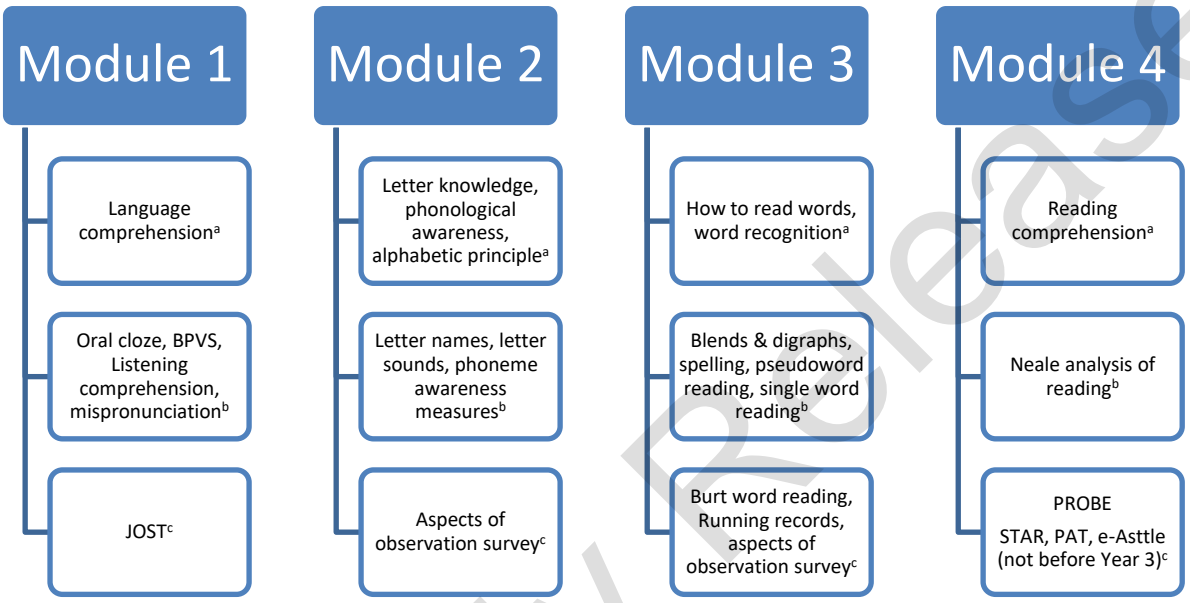


Figure 5: Relationship of module to model of reading[a], assessment framework[b] and to current assessments[c]

Module 1: Introduction and the importance of language (early August 2014)

In this module teachers will be introduced to the cognitive development of reading framework, and the associated assessment framework. This module will include an assessment task and other brief activities aimed at activating schema and teachers' thinking about the needs of their children. In addition, the first module will include an introduction to effective instruction, including the roles of direct explicit instruction and implicit discovery learning. Another aspect will be the use of teachers' own data for the purpose of driving instruction.

The second part of module 1 will encompass a deeper examination of the role of vocabulary in decoding and language comprehension. Vocabulary knowledge at the beginning of school not only appears to have an immediate impact on the development of word recognition skills but also has a strong direct relation to future reading comprehension performance (Senechal, Ouellette, & Rodney, 2006; Tunmer & Chapman, 2012a, 2012b). Children with limited understanding of the words of spoken language will encounter difficulty constructing meaning from text. During the early stages of learning to read, oral

language factors, such as vocabulary knowledge, do not "show up" as major influences on reading comprehension because the inability to recognize the words in text limits the ability to understand text. However, this does not suggest that instruction in foundation skills should be delayed until children have acquired fast, accurate word recognition skills (Tunmer & Chapman, 2012b).

Module 2: Understanding letter knowledge and phonological awareness: learning how to read words (September, 2014)

In this module teachers will be introduced to the specific developmental processes of letter knowledge and phonological awareness, emphasising the way that they interact to contribute to alphabetic coding skills.

A large body of scientific research indicates that comprehending text in an alphabetic orthography depends on the ability to recognize the words in text accurately and quickly; that the development of automaticity in word recognition in turn depends on the ability to make use of letter-sound relationships in identifying unfamiliar words; and that the ability to discover mappings between spelling patterns and sound patterns in turn depends on the ability to detect phonemic sequences in spoken words (Pressley, 2006).

Research on how children learn to read indicates that achievement in reading comprehension performance depends on the ability to recognize the words of text accurately and quickly. For progress to occur in learning to read, the beginning reader must acquire the ability to translate letters and letter patterns into phonological forms (Ehri, 2005; Snow & Juel, 2005; Tunmer & Nicholson, 2011). Making use of letter-sound relationships provides the basis for constructing the detailed orthographic representations required for the automatization of word recognition (or what Ehri, 2005, calls *sight word* knowledge), thus freeing up cognitive resources for allocation to sentence comprehension and text integration processes (Pressley, 2006).

Module 3: Developing word knowledge for fluency (early November, 2014)

In this module teachers will be introduced to different word reading strategies that children need to learn, and how they are used in conjunction with each other.

Phonics instruction also provides a 'kick-start' to phonological decoding for children who come to reading with few of the necessary cognitive entry skills, and who rely mostly on picture cues, partial visual cues, and sentence-context cues, with little interaction between the graphemes of printed words, and phonemes of spoken words (Tunmer & Greaney, 2010). For these children, the word recognition skills remain weak because they are unable to develop a rich network of sublexical connections between the orthographic and phonological representations in lexical memory. The use of inefficient word recognition processes drains the cognitive resources for comprehending the text being read.

Venezky (1999) argues that phonics instruction provides the processes by which learners can make estimates of the phonological representation of an unknown word. Explicit

phonics instruction enables learners to explicitly produce approximate phonological representations (i.e., partial decodings) of unknown printed words (Tunmer & Arrow, 2013). These partial decodings are then used to generate alternative pronunciations of the words until one is found that matches a word in lexical memory and fits the context as well (Tunmer & Chapman, 2011). The size of the reader's vocabulary is a critical component of the generation of alternative pronunciations. If a reader does not have the attempted word in their vocabulary they will not be able to come up with a suitable alternative and will be unable to induce the patterns from that word. When spelling-sound relationships are correctly identified they are stored with the accurate orthographic representation of words, which provide the data base from which further letter-sound patterns can be induced. Once children reach this point of development explicit instruction is not needed for word recognition and decoding.

Module 4: Reading comprehension as the goal (mid-February, 2015)

In this module teachers are introduced to direct instruction in comprehension instruction and how this can be introduced in junior classrooms. To reduce the negative Matthew effects in literacy there are three sources of variance that teachers must take into account: the reader, the text, and the activity engaged in (Snow, 2002). Connor and colleagues have found that attention to all of these aspects contributes to greater vocabulary development and reading comprehension outcomes in third grade classrooms (Connor, et al., 2014). This module will examine the effects of text choice and learning activity selection for comprehension instruction. It will also look at explicit reading comprehension strategy instruction and its place in the year 1 classroom.

Initial comprehension instruction for beginning readers is less directed than word reading and vocabulary building. With beginning readers the pre-requisite abilities for language comprehension, as indicated in Figure 1, are additional influences on reading comprehension (de Jong & van der Leij, 2002; Ouellette & Beers, 2010; Tunmer & Chapman, 2012b). These pre-requisites must first be assessed and identified before more dynamic comprehension-focused instruction can begin. Through the other aspects of reading already covered most children will be able to create basic meaning of text that is read; they will have sufficient cognitive processing abilities to do so as decoding skills become more efficient and a higher level of word level automaticity is achieved.

Module 5: Differentiated instruction as the goal (early May 2015)

In this module teachers will be introduced to ideas for reconceptualising how to use whole class and small group instruction for the differentiated classroom. The long-standing approaches to reading in the junior classrooms are guided reading and shared reading (Ministry of Education, 2003). Vocabulary is critical so should be the cornerstone of instruction in beginning classrooms. Although the Language Experience approach is good at this, shared reading can build vocabulary beyond what Language Experience can do by the provision of text structure and vocabulary that children might not otherwise generate.

Shared reading during the first year of school should emphasise the development of vocabulary and oral language, rather than as a means for introducing aspects of print and for developing fluency This approch encourages the use of multiple forms of shared book reading and reading aloud, including a variety of picture books (e.g., Braid, 2012) rather than the use of 'big books' alone.

Having an explicit knowledge of how children learn to read enables teachers to make informed instructional decisions that will move children forward. The use of specific assessments for beginning readers can also inform those decisions. Expectations are therefore based on what is known about the specific abilities, and what the next instructional steps should be. Another aspect of changing expectations is to be explicit in the use of direct instruction. This means telling children what they are learning and why they are learning it (Davis, 2007; Duffy, 2009). The small group instruction that beginning readers receive in the first year should not take the form of guided reading, in which children read their way through a text (Fountas & Pinnell, 1996; Ministry of Education, 2003). Rather, it should be rethought of as small group reading instruction that may include book reading. The focus, however, is on the explicit teaching of the specific abilities and skills that assessments have indicated many children need. The teaching, therefore, is planned based on need and not what arises from the text, as is currently the premise of guided reading.

Results analysis plan and expected outcomes

The results will be analysed in a number of ways, using the literacy intervention provided by teachers, as the independent variable. The school-entry assessment data collected at time one will provide the baseline variables to illustrate added value from the intervention. In addition, behaviour data and home literacy environment data will provide further benchmark measures. The expected outcomes are indicated below; all quantitative analyses are expected to have at least moderate effect sizes using Cohen's *d*.

1. *The intervention will be effective in improving literacy outcomes.* This outcome will be illustrated by the comparison of reading comprehension outcomes measured using the NEALE analysis of reading. The comparison of spelling outcomes will be carried out using the standardised WRAT spelling measure. Context-free word reading will be measured using the BURT word reading measure. Additional literacy outcomes will be compared using receptive vocabulary, listening comprehension, and strategy use for unknown words in reading and spelling. The expectation is that, when holding control variables constant, children in the intervention classrooms will achieve higher literacy outcomes at all end of year time points.
2. *The intervention will be effective in improving motivation for reading.* To examine if the intervention will improve reading motivation, self-efficacy of intervention and comparison children will be analysed. The expectation is that, when holding control

variables constant, children in the intervention classrooms will have more positive levels of reading self-efficacy than children in the comparison classrooms.

3. *The intervention will be effective in reducing the literacy achievement gap.* Children who started school with less literacy ability will be compared to examine the added-value of the intervention to those children. A 2x2 analysis analysis of variance with repated measures will be carried out, comparing the growth in the reading comprehension, spelling, single word reading, listening comprehension and vocabulary change. It is expected that the children who start school with less ability in intervention classrooms will have higher outcomes than comparable children in comparison classrooms. Children with higher skills will also be expected to have higher outcomes than comparable children in comparison classrooms, but to a lesser extent than those children in the intervention classrooms.
4. *The intervention will increase teacher confidence in teaching word-level skills.* Using qualitative interview data and quantitative data from the coding of videos of classroom instruction, it is expected that teacher confidence will increase in the teaching of word-level skills to children. In particular, teachers will become more confident in flexible teaching of such skills. The expectation is that intervention teachers will feel more positive about their practice and children's achievement compared to comparison group teachers. The use of word-level instruction will be higher in the video coding data for teachers in intervention classrooms, but meaning-level instruction will remain constant.

A number of operational outcomes are also intended. These outcomes represent the previous analysis findings.

5. *Assessment framework for New Zealand junior classrooms.* Using hierarchical linear modelling the assessments that best predict within-year and later literacy outcomes will be identified and a package of literacy assessments that will support instructional decisions for the first year of schooling will be developed.
6. *Professional development programme.* The effectiveness of the intervention, as provided by teachers, will lead to the development of the professional development and learning programme. This fully developed programme will be available for use by PLD providers.

Budget

Budget costs and deliverables will be linked as outlined in the table below. A more detailed budget is provided in Appendix 2.

	Milestone	Deliverable	Date	Budgeted costs
1	Planning, design and ethics completed	Project plan documentation	May 2014	s 9(2)(a), s 9(2)(ba)(i)
2	Amending SoW, sampling of schools, consultation and consent process with schools, purchase of materials and resources, PhD scholarship enrolments	Completed meetings and full list of schools and teachers who have consented to participation, completion of materials for intervention programme	December 2014	
3	Completion of initial intervention/PLD programme with teachers and first six months of data collection with children and teachers	Progress report on the provision of the PLD as a vehicle for the intervention teaching approach and quantitative comparison of children in intervention and control schools	July 2015	
4	Second six months of data collection with children and teachers and completion of PLD programme	Progress report focusing on quantitative comparison of children between intervention and control schools.	December 2015	
5	Following first 6 months of second year of data collection with children.	Progress report on qualitative teacher outcomes and longitudinal child outcomes	July 2016	
6	Second 6 months of second year of data collection with children.	Progress report on qualitative teacher outcomes and longitudinal child outcomes	December 2016	
7	Analyses of complete longitudinal data set	Progress report on qualitative teacher outcomes and longitudinal child outcomes	July 2017	

8	Report writing	Draft report	20 Sept 2017	s 9(2)(ba)(i), s 9(2)(a)
9	Report writing	Final report	5 December 2017	
Total			3 years	1,250,000.00

The project team

Principal Investigators

The principal investigators for this project are Dr Alison Arrow and Professor James Chapman. Dr Arrow has extensive research experience in the development of literacy in early childhood using a variety of methodologies, including both quantitative and qualitative. Dr Arrow's research has included two research projects with Professor Claire McLachlan, examining the effectiveness of professional development on literacy with ECE teachers. This research has included the assessment of literacy abilities with children as young as three-years-old. She has published on the nature of literacy in early childhood and current research has looked at literacy development alongside digital technology use. Dr Arrow has won a number of internal Massey University research grants and in 2012 she was the Massey University College of Education Early Career Research Award Winner. She has reviewed research manuscripts for a large number of journals and is currently on the editorial board of the *Australian Journal of Language and Literacy*.

Professor Chapman has published over 100 journal articles, book chapters and books on learning disabilities, special education, literacy learning difficulties, early literacy development, reading intervention, and self-system factors in academic achievement. He serves or has served on the editorial boards of the *Journal of Educational Psychology, Journal of Learning Disabilities, Learning Disability Quarterly, Australian Journal of Learning Difficulties, the Asia-Pacific Journal of Development Differences,* and the *International Journal for Research in Learning Disabilities.* Professor Chapman served a 4-year term as President of the International Academy for Research in Learning Disabilities, and has been a member of the Executive Board for 20 years. In addition, he is an international member of the Advisory Board of the Sampoerna Faculty of Education, Indonesia, and is an international consultant for the Semarang State University curriculum development project, also in Indonesia. In 1999 he was co-winner of the International Reading Association's Dina Feitelson Award for Excellence in Research.

Associate Investigators

The associate investigators are Distinguished Professor William Tunmer, Dr Keith Greaney and Dr Jane Prochnow. Distinguished Professor Tunmer is widely respected as one of the world's top researchers in the literacy field. He is the co-developer of the Simple View of Reading which has been widely accepted as the most persuasive model of reading development. He was co-winner of the International Reading Association's Dina Feitelson

Award for Excellence in Research with Professor Chapman in 1999. Dr Greaney was a primary school teacher and Resource Teacher of Literacy for more than 20 years and has substantial expertise in the application of research to classroom practice for the purposes of increasing literacy outcomes for students who experience literacy learning difficulties. Dr Prochnow has expertise in child behaviour and its relationship with literacy development. Her background is in Educational Psychology and Applied Behaviour Analysis and she is knowledgeable about theories and strategies for literacy development with children with behaviour difficulties. Brief CVs of each of the associate investigators are attached.

Academic consultants

The project has sought three leading academics on literacy development to act as academic consultants on this project. The first is Professor Catherine Snow, who is the Patricia Albjerg Graham Professor of Education at Harvard University. Professor Snow is an expert on literacy development in young children with a focus on bilingualism and language development and the influence on literacy learning. The second is Dr Wes Hoover, who is President and CEO of SEDL (Southwest Educational Development Laboratory) in Austin, Texas. SEDL is a non-profit company that carries out educational research, development and dissemination throughout the United States. Dr Hoover has researched and published in bilingualism, early reading and language acquisition. The third academic consultant is Professor Sharon Vaughn who is H.E. Hartfelder/Southland Corp Regents Chair and the executive director of The Meadows Center for Preventing Educational Risk at the University of Texas, Austin. Professor Vaughn is an expert in the area of reading difficulties and has extensive experience in intervention research with children with learning and reading difficulties.

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Doctoral students

To assist with the project work, and to support upcoming researchers for the New Zealand context, two doctoral students will participate in the project. The first, Christine Braid, currently works for the Centre for Educational Development in Massey University's Institute of Education. Christine provides professional development and advice to primary school teachers, with a particular specialty in literacy and literature. Christine brings extensive professional development experience to the project. She has also been teaching the material that has been incorporated into the PLD modules in Massey University's teacher education programme. Christine's role will be to provide the professional development content of the project, and oversee any additional facilitators who are required for the project.

The second doctoral student is Sarah Wild, who is currently a junior school teacher in Wellington. Sarah has recently completed her Masters of Literacy Education with Distinction, with a specific focus on effective literacy practice in new entrant classrooms. Sarah's role will be to carry out the assessments with children and to oversee additional research assistants that will be required to ensure assessments are carried out in a timely manner.

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Brief CVs of research project team investigators

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Positions Held

2011-present, **Senior lecturer**, College of Education, Massey University, Palmerston North, New Zealand.

2006-2010, **Lecturer**, College of Education, Massey University, Palmerston North, New Zealand.

2004-2006, **Part-time lecturer in developmental psychology**, Department of Psychology, University of Auckland, New Zealand.

Grants and Awards

2014, **Porirua Foundation & Infinity Foundation grant;** Co-principal investigator, *Examining the long-term effectiveness of the 'Sounds like Fun' early literacy programme with New Entrants*; $50,000.00

2013, **Massey University CoHSS Early Career Research Fund**; Co-principal investigator, *Learning to be literate with smart screens*; $5,000.00.

2013, **Massey University Early Researcher Career Award**; Principal investigator, *Orthographic development from early childhood*; $2,000.00.

2013, **MSD Trust research grant**; Project manager and associate investigator, *Literacy assessment and intervention in Auckland schools*; $50,000.00.

2013, **Massey University Research Fund**; Co-principal investigator, *Emergent literacy at home*; $3,111.00.

2012, **Massey University,** College of Education Research Award – Early Career.

2010, **Massey University Research Fund**; Co-principal investigator with Associate Professor C. McLachlan, *Coach and guide: Facilitating children's literacy development in ECE;* $11,000.00.

2009, **Massey University Research Fund**; Principal investigator, *Home-school partnerships*; $5,500.00.

Recent Publications & Presentations

Greaney, K. T., & **Arrow, A.W**. (2014, in press). The importance of teaching phonological-based spelling skills. *Kairaranga.*

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Arrow, A. W., McLachlan, C., Finch, B., & Craig, J. (2013, July). *The linguistic and literacy knowledge of New Zealand teachers: A summary of three studies*. Symposium paper presented at the 20th Annual Meeting of the Society for the Scientific Study of Reading, Hong Kong, 12-14 July.

Greaney, K., & **Arrow, A. W**. (2012). Some variables affecting student error response patterns in a multiple choice reading comprehension task: Implications for primary teachers. *International Journal of Innovative Interdisciplinary Research, 1(2),* 51-65.

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Greaney, K., & **Arrow, A. W**. (2012). Phonological-based assessment and teaching within a first year reading programme in New Zealand. *Australian Journal of Language and Literacy, 35,* 9-32.

Arrow, A. W. (2012, July). *Alphabet knowledge and phonological awareness in the acquisition of early orthographic representations*. Paper presented at the 19th Annual Meeting of the Society for the Scientific Study of Reading, Montreal, Canada, 11-15 July.

Arrow, A. W. & Finch, B. T. (2012, July). *Multimodal literacy practices in beginning classrooms and at home: The differences in practices and beliefs*. Paper presented at the 47th United Kingdom Literacy Association International Conference, University of Leicester, Leicester, UK, 6-8 July.

McLachlan, C. & **Arrow, A. W.** (2012, July). *Professional learning about literacy in the early childhood setting: Findings of two intervention studies in New Zealand.* Paper presented at the 47th United Kingdom Literacy Association International Conference, University of Leicester, Leicester, UK, 6-8 July.

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McLachlan, C. & **Arrow, A.** (2010, July). *Knowledge of letters and sounds: promoting awareness in early childhood settings in New Zealand.* Paper presented at International Reading Association 23rd World Congress on Reading, Sky City Convention Centre, Auckland, New Zealand, 12-15 July.

McLachlan, C. & **Arrow, A**. (2010, September). *Teachers' knowledge of literacy in early childhood: can dominant voices be challenged?* Paper presented at 20th EECERA Conference, University of Birmingham, 6-8 September.

Tunmer, W. E., Nicholson, T., Greaney, K. T., Prochnow, J. E., Chapman, J. W., & **Arrow, A. W.** (2009). PIRLS before swine: A critique of New Zealand's National Literacy Strategy. *New Zealand Journal of Educational Studies, 39,* 105-119.

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Greaney, K.T. & **Arrow. A.W.** (2009). An analysis of Year 4 and Year 8 spelling errors from an expressive writing task in the 2006 NEMP project. *Kairaranga, 10,* 31-36.

McLachlan, C. & **Arrow, A**. (2009, July). *Encouraging knowledge of letters and sounds: what role do teachers play?* Paper presented at 16th International Conference on Learning, University of Barcelona, Barcelona, Spain, 1-4 July 2009.

McLachlan, C. & **Arrow, A**. (2009, July). *Enhancing alphabetic and phonological awareness in young children through professional development with teachers: an examination of findings in New Zealand early childhood centres*. Paper presented at the 16th European Conference on Reading, University of Minho, Braga, Portugal, 19-22 July.

McLachlan, C. & **Arrow, A**. (2008, November). *Knowledge of letters and sounds: Preliminary analyses of whether they can be enhanced in two early childhood settings.* Paper presented at the New Zealand Association of Research in Education Conference, Palmerston North, New Zealand.

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Arrow, A., Fletcher Flinn, C., & Nicholson, T. (2007). Developing literacy knowledge in preschool: The role of phonological awareness and alphabet knowledge. In *15th Biennial Conference of the Australasian Human Development Association* (pp. 79). Sydney, NSW, Australia: Australian Human Development Association.

Brief CV for Professor James Chapman, PhD, Massey University, New Zealand

James Chapman is professor of educational psychology at the Massey University Institute of Education. He has an MA degree in Education from Victoria University, and a PhD in Educational Psychology from the University of Alberta, Canada. Professor Chapman has been at Massey University since 1980, and during that time he has held a range of positions, including Head of the Department of Learning and Teaching from 1994 to mid-2002 and Pro Vice-Chancellor (Executive Dean) of the College of Education from July 2002 to December 2012.

Professor Chapman has a background in secondary school teaching in History, Social Studies and Geography. At Massey University, he has taught across a number of areas in educational psychology, special education, learning disabilities, and research methods. His research activities focus on motivational aspects of learning difficulties and more recently, on factors associated with the acquisition of reading and the emergence of reading difficulties. He has published in a range of international journals, and in 1999 was co-winner of the International Reading Association's Dina Feitelson Award for Excellence in Research. In 2010 he completed a four-year term as President of the International Academy for Research in Learning Disabilities. He is on the Editorial Board of the *Journal of Learning Disabilities, Learning Disability Quarterly,* and the *Australian Journal of Learning Disabilities.*

Selected Recent Publications

Chapman, J.W., Tunmer, W.E., & Prochnow, J.E. (2000). Early reading-related skills and performance, reading self-concept, and the development of academic self-concept: A longitudinal study. *Journal of Educational Psychology, 92*, 703-708.

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Tunmer, W.E., & Chapman, J.W. (2006). Metalinguistic abilities, phonological recoding skill, and the use of context in beginning reading development: A longitudinal study. In R.M. Joshi & P.G. Aaron (Eds.), *Handbook of orthography and literacy* (pp. 617-635). Mahwah, NJ: Lawrence Erlbaum Associates.

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Chapman, J.W., Greaney, K.T., & Tunmer, W.E. (2007). How well is Reading Recovery really working in New Zealand? *New Zealand Journal of Educational Studies, 42*, 17-29.

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Brief Biographical Note for Distinguished Professor William Tunmer

William Tunmer is Distinguished Professor of Educational Psychology at the Massey University Institute of Education. He received his PhD in Experimental Psychology from the University of Texas at Austin in 1979, specializing in the areas of theoretical linguistics, psycholinguistics, and cognitive development. From 1980 to 1988 he held academic positions at the University of Western Australia. In 1988 he took up a professorship at Massey University, where he served as Head of Department and Dean of the Faculty of Education. He has published over 100 journal articles, book chapters, and books on early literacy development, literacy learning difficulties, and reading intervention. He has served on the editorial boards of numerous academic journals, and in 2012 he completed a 5-year term as Associate Editor of *Reading and Writing.* He currently serves as scientific adviser to a 5-year (2010-2015), literacy research project at Harvard University. In 1999 Professor Tunmer was co-winner of the International Reading Association's Dina Feitelson Award for Excellence in Research.

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Keith Greaney

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Jane E. Prochnow

Senior Lecturer in the Massey University Institute of Education.

Her particular interests are in theories and strategies for literacy development and working with children with difficult behaviour. Her background is in Educational Psychology and Applied Behaviour Analysis. Her research has been in the areas of suspension and teachers' classroom needs for inclusion. She has also published widely in the areas of inclusion, special education, and restorative practices. She is currently involved with research investigating early home practices, literacy and motivational variables related to reading and behaviour problems. Jane has served on the Board of Editors of the *New Zealand Journal of Educational Studies* and is currently a founding member of the Executive of the Educational Psychology Forum. Jane has also been appointed as a Visiting Scholar at the Harvard Graduate School of Education (2011) and received an appointment as a Visiting Scholar/Researcher at the University of Texas at Austin (2013).

Selected recent publications:

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Appendix 1: Detailed module information

Module 1: Introduction and language comprehension

Content	Tools/Activities	Linked community work
Overview and welcome. Introduction to the research project and participants roles.	Vignettes provided and analysed	
Introduction to the framework underpinning the PLD. Overview of the theory and research. Discuss what it means for practice in junior classrooms.	Follow framework and revisit the vignette analysis	
Language development and the role of language comprehension in literacy development. Discuss the research. Discuss the research showing the role of language development on comprehension and word reading ability. Discuss the role of background knowledge. Discuss the learning of story structure and syntactic structure. Bilingual learners in junior classrooms.	Reading on language development and role in early literacy.	
Assessment. How to assess the components of language comprehension. Syntax, receptive vocabulary, background knowledge, book structure knowledge. Look at assessment tools to be used in the programme and what they can tell us.	Identify current assessment practices. Working on using and analysing language assessment measures.	
Instruction of language. Discuss what the framework suggests we teach and how the assessments illustrate this. Discuss what to teach and how to teach language comprehension to extend learners. What are the specific kinds of Learning Intentions that would be relevant?	Watch selected video samples to discuss and analyse practice. Use worked examples of assessment data to analyse and set learning intentions. Planning the instruction to teach the LIs.	Sharing of samples of instruction in online fora.
Recap of the three goals: Teacher knowledge, assessment, teaching practice.	Case study guides. Module survey link provided.	Case studies to be carried out and ongoing learning from case study to be shared in online community.

Module 2: Letter knowledge and phonological awareness: Learning how to read words

Content	Tools/Activities	Linked community work
Welcome. Recap of language comprehension and experiences in working on case study child. Share video practice for feedback in groups and discuss new learning.	Use video recorded by teachers in their own classrooms, focusing on language comprehension instruction. Video analysis guidelines are provided.	
Review theoretical framework. Focus on implications of letter identification, phonological awareness and alphabetic principle acquisition. Discuss what phonological awareness and alphabetic principle knowledge are. Why they are important for learners and for teachers to be knowledgeable about.	Address misunderstandings of PA and alphabetic principle.	
Assessment. How to assess the components of phonological awareness and the alphabetic principle. What to look for in letter identification measures. Look at assessment tools to be used in the programme and what they can tell us.	Identify current assessment practices. Working on using and analysing letter knowledge, phonological awareness and alphabetic principle measures.	
Instruction of PA, letters, and the alphabetic principle. Discuss what the framework suggests we teach and how the assessments illustrate this. Discuss what to teach and how to teach these abilities to extend learners. What are the specific kinds of Learning Intentions that would be relevant? What are the strategies?	Watch selected video samples to discuss and analyse practice. Use worked examples of assessment data to analyse and set learning intentions. Planning the instruction to teach the LIs.	Sharing of samples of instruction in online fora.
Recap of the three goals: Teacher knowledge, assessment, teaching practice.	Case study guides. Module survey link provided.	Case studies to be carried out and ongoing learning from case study to be shared in online community.

Module 3: Developing word knowledge for fluency

Content	Tools/Activities	Linked community work
Welcome. Recap of letters, PA and the alphabetic principle; experiences in working on case study child. Share video practice for feedback in groups and discuss new learning.	Video analysis guidelines are provided.	
Review theoretical framework looking at extending alphabetic coding skills and the role it plays in learning to read words. Discuss how words are learned by children at-risk and the ways they differ from children who are not at-risk. Discuss the implications for reading and spelling.		
Assessment. Assessing the skills that contribute to developing sight words and automaticity. This includes learning how to read unfamiliar words. What to look for in word reading measures and how they differ to current measures such as running records. Look at assessment tools to be used in the programme and what they can tell us.	Identify current assessment practices. Analysis of word reading measures and identifying teaching and learning needs from them.	
Instruction of word reading and the development of fluency. Discuss what the framework suggests we teach and how the assessments illustrate this. Discuss what to teach and how to teach these abilities to extend learners; consider both reading and spelling. What are the specific kinds of Learning Intentions that would be relevant? What are the strategies?	Watch selected video samples to discuss and analyse practice. Use worked examples of assessment data to analyse and set learning intentions. Planning the instruction to teach the LIs.	Sharing of samples of instruction in online fora.
Recap of the three goals: Teacher knowledge, assessment, teaching practice.	Case study guides. Module survey link provided.	Case studies to be carried out and ongoing learning from case study to be shared in online community.

Module 4: Reading comprehension

Content	Tools/Activities	Linked community work
Welcome. Recap of how to learn to read words for fluency and experiences in working on case study child. Share video practice for feedback in groups and discuss new learning.	Video analysis guidelines are provided. Use of teacher generated video from their own classes.	
Review theoretical framework looking at reading comprehension. Discuss how reading comprehension is influenced by the prior abilities; how word reading and language comprehension lead to reading comprehension. Discuss what else may be needed to be able to comprehend written text.		
Assessment. The role of prior assessment of contributing abilities. Discuss what you are looking for when assessing reading comprehension. The difference between assessing comprehension outcomes and what children do to comprehend text. Look at assessment tools to be used in the programme and what they can tell us.	Identify current assessment practices. Analysis of reading comprehension measures and identifying teaching and learning needs from them.	
Instruction of reading comprehension. Discuss what the framework suggests we teach and how the assessments illustrate this. Discuss what to teach and how to teach these abilities to extend learners. What are the specific kinds of Learning Intentions that would be relevant? What are the strategies?	Watch selected video samples to discuss and analyse practice. Use worked examples of assessment data to analyse and set learning intentions. Planning the instruction to teach the LIs.	Sharing of samples of instruction in online fora.
Recap of the three goals: Teacher knowledge, assessment, teaching practice.	Case study guides. Module survey link provided.	Case studies to be carried out and ongoing learning from case study to be shared in online community.

Module 5: Differentiated instruction as the goal

Content	Tools/Activities	Linked community work
Welcome. Recap of reading comprehension; experiences in working on case study child. Share video practice for feedback in groups and discuss new learning.	Video analysis guidelines are provided. Use of teachers own video focusing on reading comprehension instruction.	
Review theoretical framework and its overall implications for teaching and for learning. Discuss what has been learned through this process. Describe the implications of the framework for differentiated instruction.		
Assessment. Discuss how assessment contributes to the development of differentiated instruction plans. Use the framework for developing assessment schedules for teams and classrooms.	Identify current assessment practices. Review classroom data from project data sets.	
Instructional practices within the differentiated classroom. How to meet the needs of all students. Using existing practices in new ways to meet the needs of all learners.		
Recap of the three goals across the PLD programme as a whole: Teacher knowledge, assessment, teaching practice. Discuss changes in classroom practice and in student learning. Recommendations for improvement. Discuss the role of leadership in implementing practices.	Case study guides for whole class practice. Module survey link provided.	Case studies to be carried out and ongoing learning from case study to be shared in online community.

Appendix 2: Detailed budget

		Year 1	Year 2	Year 3	Total
Academic FTEs	James Chapman	s 9(2)(f)(iv)			
	Alison Arrow				
	Keith Greaney				
	Bill Tunmer				
	Jane Prochnow				
	Total				
Professional Time	Salary Costs				
	Super Costs				
	ACC				
	Total				
Scholarships	Stipend x2				
	Fees x2				
	Total				
Subcontracts	Teacher Release				
	Test Administrators				
	Academic Consultants				
	Advisory Consultants				
	Total				
Other Direct Costs	Computing Costs				
	Minor Equipment				
	Materials/consumables				
	Photocopying/Printing				
	Postage and Courier				
	Computer Software				
	Staff Training				
	Stationery				
	Travel				
	Dissemination Travel				
	Total				
Overheads	Central Overheads				
	Department Overheads				
	Total				
Project Summary	Professional Time				
	Scholarships				
	Subcontracts				
	Other Direct Costs				
	Overheads				
	Project Total	**524,753**	**437,653**	**287,593**	**1,250,000**