Mitigating reading failure in adolescents: Outcomes of a Direct Instruction reading program in one secondary school

Susan Main

Edith Cowan University

Margie Backhouse

Edith Cowan University

Robert Jackson

Curtin University

Susan Hill

Edith Cowan University

ABSTRACT

International and national data continue to identify poor literacy standards among secondary school students. The researchers, in collaboration with a metropolitan secondary school in Perth, Western Australia, elected to use the Direct Instruction Reading Mastery *program to improve students' reading skills. Data on reading performance was collected from 59 Year 7–9 students identified by their teachers as having poor reading skills. Students were assessed using the Woodcock Reading Mastery III and were retested twice during the remainder of the year. Teaching staff were observed delivering the program and were interviewed in the final term of the year to ascertain their experiences while using the program. Results showed a statistically significant improvement in students' reading performance. There was a moderate, statistically significant correlation between higher reading improvement and higher attendance. The program was effective for students regardless of equity group. Semi-structured interviews with the teacher and teaching assistants delivering the program indicated they were overwhelmingly positive about the program but identified difficulty delivering it with fidelity. This was also noted during classroom observation. The results from this research support the efficacy of using Direct Instruction programs, such as* Reading Mastery*, to improve the reading outcomes for adolescent students who are struggling to read. However, they also highlight the complexity of influencing reading success for students in secondary schools, with factors such as attendance and fidelity of delivery influencing the success of the program.*

The consequence of failing to learn to read has attracted considerable research interest, leading to the identification of strong links to a range of poor educational and life outcomes (Bost & Riccomini, 2006; Lyon, 2001; Quinn, Rutherford & Leone, 2005; Ziomek-Daigle & Andrews, 2009). While this has seen an emphasis on school-wide early intervention to ameliorate reading difficulties, research evidence about effective reading interventions in secondary schools is limited (Joseph & Schisler, 2009), despite its vital importance in meeting nationally mandated minimum literacy standards in Australia. As children progress through upper primary

into secondary school, reading becomes an increasingly important mode for learning (Daggett & Hasselbring, 2014), yet the frequency of reading instruction diminishes (Edmonds et al., 2009). If students do not acquire basic reading skills by the time they enter secondary school, they are unable to read and comprehend material in their textbooks and thus struggle to achieve academically (Vaughn et al., 2015), develop job readiness skills (Slavin, Cheung, Groff & Lake, 2008), or even successfully complete their schooling (Biancarosa & Snow, 2006). In Australia, future success in study and the workplace is arguably determined by academic achievement in Year 9 (Goss, Sonnemann, Chisholm & Nelson, 2016), in addition to the better employment outcomes that come from completing secondary schooling (Australian Institute of Health and Welfare [AIHW], 2017).

The research reported in this paper resulted from a request to the lead researcher by a metropolitan secondary school in Western Australia (WA) for assistance in improving the reading outcomes of their students. The researchers provided the school with information on approaches to reading instruction for secondary students and programs that could be implemented. Based on this information, the school selected the Direct Instruction *Reading Mastery* (2008) program. The aim of this research was therefore to explore the efficacy of the program for improving students' reading skills.

Literacy standards and trends

National data indicate that approximately 20% of Year 9 (lower secondary) students are either just at or below the national minimum standard (NMS) for reading (Australian Curriculum Assessment and Reporting Authority [ACARA], 2017). This means these students are reading three or more years below grade level (Edmonds et al., 2009; Goss et al., 2016) and have difficulty comprehending secondary texts, thus markedly impairing their chances of academic success. Correspondingly, Australia's 2015 results in the Organisation for Economic Cooperation and Development (OECD) Programme for International Student Assessment (PISA) reading achievement for 15-year-olds indicate a consistent decline since entering in 2000, lagging behind our closest geographical neighbour, New Zealand (OECD, 2016).

WA's lower reading achievement in the National Assessment Program – Literacy and Numeracy (NAPLAN), relative to other states, saw increased interest in ways of improving the reading outcomes of WA students. Examination of the characteristics of schools whose results were higher than the state average identified they all used explicit approaches to reading instruction (Louden, 2015), leading to media attention at national and state levels (for example, Elks & Ferarri, 2013; Hiatt, 2013, 2015; Urban, 2019). Subsequently, explicit instruction in reading gained momentum in WA primary schools (Louden, 2015) and recent NAPLAN data suggests that WA's Year 3 and 5 results over the last two years have improved (ACARA, 2017). The same improvement is not evident in secondary schools, with both Year 7 and Year 9 students showing slight declines in mean reading scores from 2014–17 (ACARA, 2017).

Teaching reading to secondary students

The Australian Government acknowledges that quality teaching is key to student outcomes (Teacher Education Ministerial Advisory Group, 2015) and has recommended that both primary and secondary pre-service teachers understand the fundamentals of teaching reading. Although, there is a clear expectation that early childhood and primary school teachers have the requisite knowledge and skills to teach reading (ACARA, 2014), the same expectation does not exist for secondary school teachers (Elkins, 2007; Rowe & National Inquiry into the Teaching of Literacy [Australia], 2005).

Reading, spelling and writing instruction require specific content knowledge (Moats & Foorman, 2003) and the reality is that pre-service teachers are not being adequately prepared to teach reading (Meeks & Kemp, 2017; Rowe, 2006; Washburn, Joshi & Binks Cantrell, 2011). Secondary teachers typically have little experience in implementing reading instruction (Edmonds et al., 2009; Love, 2009), particularly for those students who are struggling to read and comprehend secondary school texts and course materials (Hempenstall, 2016). Cantrell, Burns, and Callaway (2008) noted that secondary English in-service teachers report feeling unprepared to teach reading while Moon (2014) identified a lack of personal literacy competence in secondary pre-service teachers, raising questions about their ability to teach these skills effectively. Secondary teachers' lack of knowledge about how to teach foundational skills in reading, and inability to isolate and articulate students' exact reading problems, results in reliance on the most commonly observed problem – reading comprehension (Wang, Sabatini, O'Reilly & Weeks, 2019), with the solution being identified as ensuring students read more (Edmonds et al., 2009).

Motivation is an important component of adolescents' engagement in reading and, as a consequence, reading ability (Guthrie, Klauda & Ho, 2013; Merga, 2016; Wigfield, Gladstone & Turci, 2016). This includes the

negative impact on engagement and motivation when adolescents see themselves as incapable of learning to read (Barton & McKay, 2016). Programs that focus on increasing secondary students' motivation to read have been identified as effective (Barton & McKay, 2016; Guthrie et al., 2013). However, recent research suggests that comprehension is also predicated on a student's ability to decode words. A study of 30,000 students (Wang et al., 2019) identified that students in Grade 5 and above with poor decoding skills made little or no progress in their reading comprehension suggesting they may be misidentified as having comprehension difficulties when they actually needed decoding instruction.

Effective adolescent literacy programs include word study, fluency, vocabulary, comprehension and motivation (Marchand-Martella, Martella, Modderman, Petersen & Pan, 2013; Scammacca, Roberts, Vaughn & Stuebing, 2015; Vaughn, Denton & Fletcher, 2010), but Marchand-Martella et al. (2013) also identify that phonemic awareness and phonics need to be taught explicitly and systematically to older students who lack these skills and knowledge. For secondary students, foundational skills such as phonological decoding make substantial contributions to students' ability to comprehend text, decode quickly and accurately, and spell (Nagy, Berninger & Abbott, 2006). Furthermore, as with primary-aged students, fluent decoding remains an important predictor of reading comprehension for secondary-aged students (Hempenstall, 2016; Kershaw & Schatschneider, 2012; Wang et al., 2019). While the end goal is always fluent reading comprehension, the role of foundational skills for struggling readers remains the key to effectively intervening with secondary students (Holmes, 2009; Suggate, Schaughency, McAnally & Reese, 2018). The need for greater intensity of reading instruction for secondary students who have not acquired the necessary reading skills has also been identified (Stevenson & Reed, 2017).

Direct Instruction

One approach to teaching reading skills is through the use of Direct Instruction (DI), an instructional model developed by Siegfried Engelmann in the 1960s. DI has its foundations in Behaviourism and the 1970s teacher-effects research that identified a set of variables significantly related to student achievement (Engelmann & Carnine, 1982). DI is now associated with commercial products, such as *Reading Mastery* (2008), that are based on Engelmann's model. These programs provide scripted lessons for teachers and have been shown to have strong beneficial effects for all students, not just students with special educational needs and lower ability (Hattie, 2009; Hempenstall, 2016; Stockard, Wood, Coughlin & Rasplica Khoury, 2018).

A large-scale longitudinal study conducted in the USA from 1967–1995, *Project Follow Through*, evaluated over 20 educational interventions based on different philosophical positions to determine which methods of teaching were most effective for disadvantaged school students (Stockard et al., 2018). Of those investigated, the DI model proved to be the most successful and was the only one to have a positive impact in all domains (Carnine, Silbert, Kame'enui & Tarver, 2004; Marchand-Martella, Slocum & Martella, 2004; Hempenstall, 2005). Fifteen years after *Project Follow Through*, the long-term outcomes of the DI program were reviewed by comparing the first three cohorts of students who were in the DI group to a control group of students from the same neighbourhood. There were highly significant differences in favour of the DI groups on numbers who graduated, applied for and went to college, with lower numbers either repeating a year or dropping out (Myer, 1984).

Since the development of these programs, evidence has continued to accrue in favour of DI-based approaches (Stockard et al., 2018; Coughlin, 2011; Hattie, 2009; Kirschner, Sweller & Clark, 2006). Reviews and meta-analyses have consistently supported its efficacy for mainstream, learning disabled and disadvantaged students (Borman, Hewes, Overman & Brown, 2003; Coughlin, 2011; Forness et al., 1997; Hattie, 2009; Purdie & Ellis, 2005; Swanson, 1999). A meta-analysis of 131 studies of *Reading Mastery* in 2016 reported a large effect size of 0.79 for the program (Stockard & Wood, 2016).

For the present study, discussions with the school personnel about the needs of the school, along with findings from the literature review, led to selection of the DI *Reading Mastery* program. A key influence was Konza and Main's (2015) study which found teachers require considerable time to acquire the knowledge and expertise to develop their own explicit teaching materials, thus potentially delaying the implementation of effective practice and consequent student improvement.

DI is an effective teaching model for teaching children from disadvantaged backgrounds, which is reflective of the student cohort for this research that has an Index of Community Socio-Educational Advantage (ICSEA) of < 850. The ICSEA is a measure of social and educational advantage in Australia that takes into account a range of student factors, including parents' occupation and education, and school factors such as geographical location/isolation and the proportion of Indigenous students (ACARA, 2018). The ICSEA scale typically ranges from 500 (extremely disadvantaged schools) to

1300 (very educationally advantaged schools) with a median of 1000 (ACARA, 2018). Metropolitan schools average around 1040, rural schools around 970, and remote and very remote schools are typically lower than 850 (Bonnor & Shepherd, 2016). As the school involved in this research is in a metropolitan area, an ICSEA lower than 850 indicates that its students experience considerable disadvantage compared to those in other metropolitan schools.

Project overview

The recently introduced requirement for all WA students to demonstrate a minimum standard of literacy and numeracy to qualify for secondary school graduation (School Curriculum and Standards Authority, 2014) is increasing pressure on secondary schools to respond to the growing numbers of students struggling to read (ACARA, 2017).

This collaborative project was designed in partnership with school personnel with the goal of identifying the reading difficulties being experienced by students and improving the reading outcomes for these students through changes to teaching and learning practices. The DI *Reading Mastery* program used in the study provides scripted lessons that support teachers unfamiliar with teaching reading to deliver appropriately sequenced and comprehensive instruction. The researchers provided training and support for the teachers in the implementation of these materials.

The *Reading Mastery* program has a series of levels which start with beginning reading skills and progress to more complex skills. However, throughout the program, there is an emphasis on the essential components of reading instruction for secondary students including phonics, vocabulary development, fluency, comprehension, spelling and writing (see Table 1). Consistent with Scarborough's model of reading acquisition (Scarborough, 2001), *Reading Mastery* focuses on developing the content and strategic knowledge necessary for becoming a skilled reader. The material covered also has relevance to other areas of the curriculum, such as science and geography, to broaden the students' general knowledge and students are exposed to content knowledge outside of the program through their secondary subject areas. Motivation is achieved through personal and teacher tracking of performance so that students can identify their own growth in learning and teachers can provide extrinsic reinforcement to support engagement in the program.

Method

A collaborative approach that involved school staff in the design of the project was used since it suited the dual goal of developing appropriate knowledge and solutions to a problem in a particular educational context (Ruppar, Bal, Gonzalez, Love & McCabe, 2018). Both the school and the researchers identified the importance of evaluating the efficacy of the approach selected in order to inform practice in subsequent years. However, it was important to the school that all students who were identified with reading difficulties were given this support as soon as possible which, together with ethical considerations, precluded the establishment of a control group. The tracking of individual student outcomes, the different commencement and completion times of the program and movement of students across classes all helped to minimise the likelihood of the results being attributable to other factors, such as individual teacher effects or class placement.

Research questions

The research questions guiding the study were as follows:

- What impact does the use of the *Reading Mastery* program have on students' reading skills?
- What supports did the staff teaching the program see as beneficial to the delivery and sustainability of the program?
- Were any other benefits of the program noted by teaching staff?

Participants

At the start of the research, English teaching staff undertook initial screening of all students in Years 7, 8, and 9 (N = 248) to ascertain their reading ability. Students who were identified as potentially achieving below Grade 6 reading level were then assessed using the *Woodcock Reading Mastery III Test* (WRMT-III) (Woodcock, 2011). The WRMT-III provides detailed results on several elements of reading skills as well as an overall reading grade level. The term 'grade' is used when referring to student reading levels rather than the more commonly used 'year' in WA, since this is the terminology used by the reading assessment. Although students who can read material at Grade 5 level are considered to be capable of accessing most lower school texts, the school chose to set an overall reading Grade of 6 on the WRMT-III as the nominal threshold for inclusion in the program. This threshold was chosen to ensure that students received the support they needed to be successful in upper secondary. As a result of this testing, 60 students between Years 7 to 9 (24.1% of the cohort) who would benefit from additional reading support were identified. The majority (61%) were boys. One Year 7 student who scored just above the Grade 6 threshold was nevertheless included in the program

Table 1. Overview of the *Reading Mastery* program

	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
Placement Test	Test (individual and small group of students) includes reading rate and accuracy of individual words and passage reading, including comprehension questions. Number of errors determines starting point and which lesson to begin teaching.				
Assessment	Ongoing informal assessments, in all key learning areas, conducted frequently throughout the program and at key milestones. Formal assessments conducted at the end of the program on fluency and spelling.				
Lessons	1 – 160	1 – 145	1 – 140	1 – 120	1–120
	Inclusive of ongoing review and consolidation of previously taught content and skills; teacher-directed exercises; individual turns and independent work.				
CONTENT					
Phonemic Awareness and Print Awareness	✓				
Phonics/Word Recognition	✓				
Word attack/Reading words	✓	✓	✓	✓	✓
Vocabulary		✓	✓	✓	✓
Fluency	✓	✓	✓	✓	✓
Comprehension and Story Reading	✓	✓	✓	✓	✓
Spelling	✓	✓	✓	✓	✓
Comprehension and Story Reading (elaboration)	Included across each grade level are: reading decodable texts, teacher modelling of fluency and expression and study skills. Comprehension strategies and skills are introduced, taught cumulatively, reviewed and practised regularly. These include, but are not limited to (and vary across grades): noting detail; visualising, making judgments; making deductions; drawing and making inferences; predicting; identifying cause/effect; accessing prior knowledge; drawing conclusions; making connections; inferring; interpreting; sequencing; and identifying the main idea.				
Spelling (elaboration)	Spelling content and skills are introduced, taught cumulatively, reviewed and practised regularly. These include, but are not limited to (and vary across grades): phonograms and segmentation (review); vowels and consonants; reading vocabulary; patterns and consonant patterns; sentences; affixes; spelling rules; word introduction; compounds; word parts; multi-syllabic words; and homonyms/antonyms/synonyms; morphology; etymology.				

due to the large discrepancy between their word identification and word attack skills (grade levels 12.7 and >12.9, respectively) and comprehension of words and passages (grade levels 3.4 and 2.5). Since *Reading Mastery* targets comprehension as well as decoding, it was felt the student would benefit from inclusion in the program.

The students were organised into 11 groups of 5 – 8 students based on reading grades, the *Reading Mastery* book levels, and teacher knowledge of how well individual students worked together. Ten groups consisted of students from both Years 7–8 with reading grades ranging from 1.1 – 6.3. The Year 9 students had reading grades of between 1.1 and 5.2 but were only divided into two groups due to the availability of teaching staff, with the teacher coordinating the program taking the most diverse group of students who had the lowest reading performance. Students attended *Reading Mastery* classes four times a week for an hour per lesson. Classes were timetabled so that students did not consistently miss any one of their core subjects – maths, science, English and humanities.

As is typical of naturalistic school settings, there was considerable movement of students in and out of the *Reading Mastery* program and between classes. Reasons for this included changes in student enrolments,

patterns of student attendance and the rapid progression of some students within the program such that reading support was no longer required. One student was present for the initial screening but absent for both of the subsequent reading assessments, so the data were not usable, leaving a total of 59 participants. As shown in Table 2, 10 students (17%) completed only the first half (9 weeks) of the program and eight students only completed the second half (14%).

Table 2. Characteristics of students that participated in the *Reading Mastery* program.

Student Characteristics	n	%
Year Level		
Year 7	23	39.0
Year 8	23	39.0
Year 9	13	22.0
At-Risk Group		
English as an Additional Language (EAL)	10	16.9
Education Support Unit (ESU)	6	10.2
Indigenous	12	20.3
Other	31	52.5
Gender		
Male	36	61.0
Female	23	39.0
Program Intake		
Terms 3 & 4: 18 weeks	41	69.5
Term 3 only: 9 weeks	10	16.9
Term 4 only: 9 weeks	8	13.6
Total Students	**59**	**100.0**

Of the 59 students involved in the program, 12 identified as being of Aboriginal or Torres Strait Islander (Indigenous) heritage and 10 spoke English as an Additional Language. Six students who were normally schooled within the Education Support Unit due to a disability or severe learning difficulties were grouped with other students for the *Reading Mastery* program according to their reading grade. The remaining students (n = 31) were not classified by the school as belonging to any particular 'at risk' or equity group.

Teaching staff

The original intention for teachers to deliver the intervention was thwarted by financial constraints. This resulted in the allocation of one teacher to oversee the implementation and support the teaching assistants (TAs) to deliver the program. A total of five Level 3 TAs were involved in the program. To be at Level 3, TAs must have sufficient knowledge and training to work with students independently. Research has shown training and support of TAs in the delivery of programs can provide successful learning outcomes for students (Blatchford et al., 2011; Keel, Fredrick, Hughes & Owens, 1999) and an assurance the program is delivered with fidelity (O'Keefe, Slocum & Magnusson, 2013). A planned, purposeful approach ensures TAs are utilised effectively (Giangreco, 2013) and thus are set up for success rather than failure. The use of a systematic, structured, scripted program such as *Reading Mastery* facilitated this approach.

Procedure

Following formal ethics approval from the university and state education department, the researchers provided coaching and mentoring as part of the program since these components are critical to the development of teachers' knowledge (Caldwell & Spinks, 2013; McCutchen et al., 2002) and enactment of their learning into classroom practice (Carlisle, Cortina & Katz, 2011). In order to ensure the longevity of the program, the lead researcher provided collaborative coaching sessions with the teacher assigned to oversee the program (school-based coach). Coaching skills were modelled and discussed with this teacher so that she could continue to provide literacy coaching (Costa & Garmston, 2002) once the research was completed. Coaching in the context of this project involved observing each of the TAs delivering a *Reading Mastery* lesson several times over the course of the year, after they had received initial training in how to use the program, and making notes on their delivery using an explicit lesson observation schedule. These observations focused on key components of the *Reading Mastery* program, including prompting, pacing, oral unison responding, and corrective feedback (Engelmann & Carnine, 1991). The TAs were given written feedback on these elements following the lesson observation and spent approximately 30 minutes discussing this feedback with the researcher and school-based coach. Following the researcher-coach-TA meeting, the researcher and school-based coach met separately to discuss the observations and compare their written feedback. This support was considered necessary to enable the school-based coach to take over the coaching role in subsequent years.

Student data

Student data were collected using the WRMT-III at three points across the year: start of the program in Term 3, after 9 weeks of *Reading Mastery* classes in Term 3, and after a further 9 weeks of classes in week 8 of Term 4. As noted earlier, some students completed only the first or second 9 weeks of the program. Hence, in presenting the results for the full sample (59 students), 'pre-test' refers to the baseline test for each student and 'post-test' to the final test for each student. When presenting the results for the sub-set of 41 students who completed the full 18 weeks, the terms 'baseline', 'retest 1' and 'retest 2' are used to depict the three data collection points.

The decision was made to only use the four areas of the assessment most closely aligned to reading ability in order to more efficiently assess a large number of students. These areas were Word Identification (words known), Word Attack (phonetic knowledge of reading), Word Comprehension (knowledge of synonyms, antonyms and skills to comprehend analogies), and Passage Comprehension (level of understanding of text read). An additional core component of effective reading, fluency was not formally assessed due to the additional testing time required and the fact that this was monitored regularly as part of the *Reading Mastery* program. The WRMT III assessment provided detailed results in these four key areas of reading, including standard scores, confidence intervals, percentile ranks, grade equivalents and Growth Scale Values (GSVs). Growth Scale Values are provided by test developers for the purpose of tracking growth or progress over time since they indicate a student's absolute performance rather than their performance relative to a normative group. They are derived from raw scores using Rasch analysis techniques and are based on an equal-interval vertical scale. The WRMT-III GSV scores range from 288 to 682, with a score of 500 set to represent the 'the achievement of an average student finishing third grade' (Woodcock, 2011, p. 30). The facility to track the absolute performance of students is particularly important with adolescent struggling readers, since any progress is important for the individual but can be masked by the fact that the normative group is also changing over time. The scale property of GSVs means they can be manipulated mathematically, unlike grade equivalents. Hence, all descriptive and inferential statistics presented in the following sections are based only on GSV scores. Where appropriate, grade equivalents are presented graphically to assist interpretation of the results. All statistical analyses were conducted using the SPSS version 24 software package.

Field notes and interviews

During the project the researchers gathered data on the teachers' and TAs' perceptions of the reading intervention and the support they were receiving. Field notes were recorded after coaching sessions to provided additional information including 'hunches' that the researcher wanted to explore, and information provided by the teacher/TA before or after the classroom observations. Eisenhardt (2002) suggests that field notes 'are an important means of accomplishing this overlap' between data analysis and data collection and describes them as 'an on-going stream of consciousness commentary about what is happening in the research, involving both observation and analysis' (p. 15).

A final semi-structured interview was conducted with each staff participant in Term 4 as interviews have the advantage of allowing a researcher to 'follow up ideas, probe responses and investigate motives and feelings' (Bell, 2005, p. 157). Information on how the program was being delivered, what difficulties teaching staff and students were experiencing and what outcomes were being achieved were the principal concerns of the researchers. As advocated by Corbin and Strauss (1990) and Yin (2009), the observations, field notes and interviews collected in the research were subject to repeated reading and constant comparisons in order to identify concepts or themes that would enable the researchers to answer the research questions.

Results

Table 3 shows the sub-test and total GSV scores on the WRMT-III at pre-test and post-test for the total sample (n=59) and the results of paired-sample *t*-tests. The observed improvements in students' overall reading performance across all four sub-tests were statistically significant at better than $p<0.001$ after applying a Bonferroni correction to account for multiple tests. The effect size for students' overall reading improvement ($d = 1.13$) exceeds Cohen's convention for a large effect ($d = 0.8$). A large effect size is also evident for Word Identification, while Word Attack and Word Comprehension indicate medium effects ($d > 0.5$) and Passage Comprehension a small to medium effect.

To provide some context for the statistically significant improvements in students' reading performance, Figure 1 presents the mean GSV scores graphically with grade equivalents superimposed at the relevant points on the GSV vertical scale. This shows that at the higher end of the GSV vertical scale, the distances between grade equivalents are relatively small. For example, grade equivalents 2 and 3 map to GSV scores of 469 and 489 – a difference of 20 – whereas grade equivalents 7 and 8 correspond to GSVs of 518 and 522 – a

Table 3. WRMT-III sub-test and total GSV scores at pre-test and post-test (mean, median, standard deviation, minimum and maximum) and results of paired-samples *t*-tests.

		Word Identification		Word Attack		Word Comprehension		Passage Comprehension		Total[2] (All Tests)	
		Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Mean		485.2	499.6	490.4	500.4	491.9	496.4	489.0	494.8	489.0	498.1
Median		484	495	494	500	492	497	492	494	492.5	496.3
Std deviation		32.5	36.5	22.7	21.5	12.0	12.7	13.3	13.2	17.04	18.21
Minimum		381	398	421	448	456	453	439	467	435	449
Maximum		555	585	528	550	525	527	516	521	515	533
Paired-samples *t*-test	t	6.21		5.44		4.57		3.72		8.71	
	d	0.81		0.71		0.59		0.48		1.13	
	p[1]	< 0.00005		< 0.00005		< 0.00005		0.00009		< 0.00005	

[1] Adjusted *p* value using a Bonferroni correction
Note: n = 59 for the total and each sub-test.

difference of only 4. This serves as a reminder of how much important learning of foundational reading skills these struggling adolescent readers have missed in the earlier grades and why it is imperative to address these learning deficits.

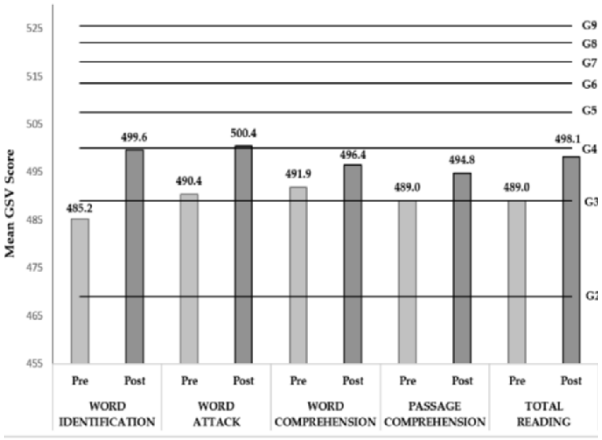

Figure 1. WRMT-III sub-test and total mean GSV scores at pre-test and post-test mapped to grade equivalent levels (n = 59).

A representation of individual improvements in reading grade equivalent from pre-test to post-test is provided by the scatterplot in Figure 2. (Some students had the same pre-test and post-test scores, so there are fewer than 59 data points visible.) This shows that at pre-test, only 16 of the students were at Grade 4 level or better; at post-test this had increased to 27, with 10 students at or above Grade 6. The most dramatic improvement in reading level was made by a Year 7 English as an Additional Language student who went from a grade equivalent of 4.8 to 9.3 in the first 9 weeks of the *Reading Mastery* program. The largest overall shift in reading level was a Year 8 student whose grade equivalent increased from 4.0 to 9.1 over 18 weeks.

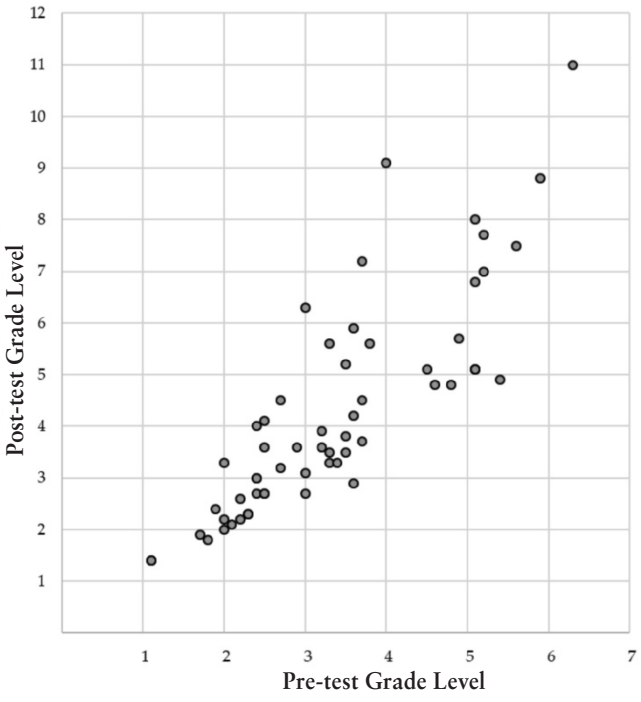

Figure 2. Scatterplot of students' pre-test and post-test total reading grade levels on the WRMT-III (n = 59).

It is evident from Figure 2 that some students made outstanding progress (> 4 grades), while others made limited progress. The starting level for several of the students was so low that they will require ongoing reading support, with four students remaining below

Grade 2 level at the end of the 18 week program. Attendance was an issue with some students, and likely had an influence on their progress. To assess whether there may be a relationship between students' attendance and their improvement in reading competency, a Pearson product-moment correlation coefficient was calculated using GSV gain scores from baseline to retest 2 and the percentage of reading lessons attended. There was a moderate, statistically significant correlation between gain scores and attendance indicating that students with higher rates of attendance tended to make larger improvements in reading competency [r = .337, n = 41, p = .03]. This is further borne out by Figure 3 which shows the average gain in GSV scores over 18 weeks for students who attended up to 50% of the reading lessons (n = 21), 51–75% of lessons (n = 8) or more than 75% of the lessons (n = 12). Note that only one student had an attendance rate of less than 26%, hence the categories 0–25% and 26–50% were combined.

As the reading program involved students from Years 7, 8 and 9, the age range of the participants was relatively large at 2.8 years (Range: 11.8 – 14.6 years, M = 13.2 years). The cohort included students of Indigenous heritage, EAL and students with a disability or significant learning difficulties based within the school's Education Support Unit (ESU). To determine whether the *Reading Mastery* program had a differential effect on students according to their year group (as a proxy for age/maturation) and/or education risk factors, a two-way mixed ANOVA was conducted. The dependent variable was the GSV score, time in the reading program (baseline, retest 1, retest 2) was the within factors factor, and 'year group' (Year 7, Year 8, Year 9) and 'educational risk group' (Indigenous, EAL, ESU, Other – students who were not classified as belonging to any particular 'at risk' or equity group) were the between-subjects factors. The assumptions for sphericity and homogeneity were met, hence no adjustments were made other than Scheffe corrections to account for multiple comparisons. The Scheffe correction was selected since this is a more conservative measure suitable for unequal groups.

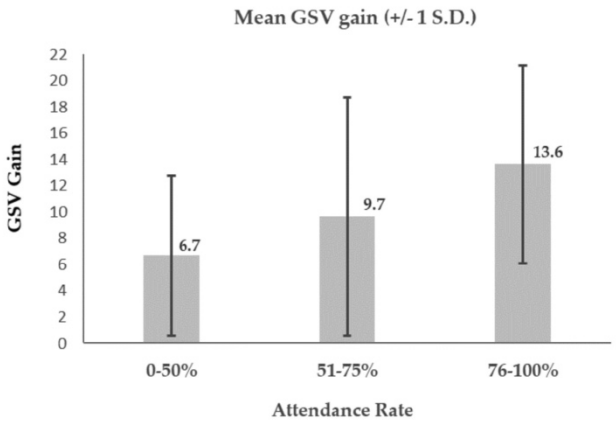

Figure 3. Mean GSV gain scores (baseline to retest 2) by attendance rate groups (n = 59). The bars represent +/- 1 standard deviation.

Table 4 shows the mean GSVs and standard deviations for each of the year groups and educational risk groups at the three time points. As might be expected given the results of the paired-samples t-tests, the mixed ANOVA analysis revealed a large main effect

Table 4. Total GSV scores on the WRMT-III at baseline, retest 1 and retest 2 for each each year group and educational risk group (means and standard deviations).

	Baseline		Retest 1 (9 weeks)		Retest 2 (18 weeks)	
	Mean	SD	Mean	SD	Mean	SD
Year Group[1]						
Year 7 (n=15)	489.9	*20.2*	495.6	*18.6*	496.3	*18.9*
Year 8 (n=18)	486.3	*12.2*	491.8	*18.3*	495.5	*16.2*
Year 9 (n=8)	484.7	*23.2*	489.4	*27.6*	499.7	*24.0*
At Risk Group[1]						
EAL (n=9)	494.1	*13.2*	499.9	*14.6*	504.3	*14.3*
ESU (n=6)	469.8	*21.4*	469.5	*27.3*	477.7	*22.0*
Indigenous (n=7)	483.3	*22.2*	488.6	*18.9*	492.4	*18.9*
Other (n=19)	491.1	*12.6*	498.2	*15.1*	500.5	*15.5*

[1] Total n = 41

of time in the reading program ($F(2, 62) = 23.584$, $p < .001$, $\eta_p^2 = .432$) on students' GSV scores. There were no significant interactions between time in the program and year group ($F(4, 62) = 2.250$, $p = .074$, $\eta_p^2 = .127$) nor time in the reading program and educational risk group ($F(6, 62) = 1.219$, $p = .309$, $\eta_p^2 = .106$). There was no significant main effect of year group ($F(2, 31) = 1.029$, $p = .369$, $\eta_p^2 = .062$) suggesting that the *Reading Mastery* was not more or less effective with specific year groups. However there was a main effect of educational risk group ($F(3, 31) = 6.275$, $p = .002$, $\eta_p^2 = .378$). Post hoc tests (using the Scheffe correction for multiple comparisons) showed that both the EAL group ($p = 0.028$) and Other group ($p = 0.026$) made significantly higher gains in GSV scores than the ESU group. This might be expected given that these students have either a disability or significant learning difficulties which impacts on their learning progress. A means plot of the GSV scores for the four educational risk groups over the three time points is provided in Figure 4. Here it is evident that the ESU students tended to make slower progress in the first 9 weeks of the program than other groups, but saw improvements in the second 9-week period. The EAL students made the most rapid and substantial progress overall.

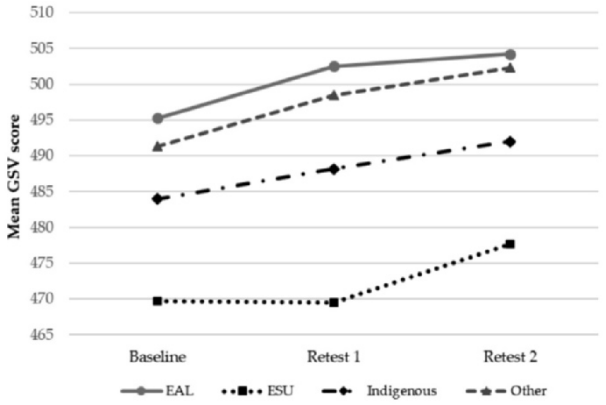

Figure 4. Mean total reading GSV scores on the WRMT-III at baseline, retest 1 and retest 2 by educational risk group.

Observations and interviews

Classroom observations and field notes were used to monitor the progress that the teaching staff made in delivering the program across the year, identify factors that influenced the success of the program, and any additional benefits of the program for the students involved. A classroom observation tool was used to record the teaching staff's delivery of content against several criteria: presentation of appropriately paced lessons to maintain motivation; high level of student engagement, measured by students' response rate; faultless instruction related to words, explanation and delivery; use of signals to minimise extraneous language; and, detecting and immediately correcting student errors. Although the classroom observations highlighted the progress that the teaching staff made in delivering the program across the year, there still remained difficulty with the correct pacing of lessons. The practical implications of the slower pace of delivery was that teaching staff were not able to complete one lesson per class until the final term of the year.

During feedback sessions and semi-structured interviews, the teacher and teaching assistants were overwhelmingly positive about the program and asked that they be allowed to continue delivering it in the following year. They commented on the students' growing confidence in reading and positive attitude to the reading lessons and were pleased that they were able to deliver this instruction. Other teaching staff at the school also reported improvements for some students in maths performance due to improved reading skills, an increased willingness to read aloud in class and improved behaviour. Teaching staff identified the coaching and mentoring as beneficial in helping them deliver the program but noted that they would have liked more opportunities to observe others delivering DI lessons. The teacher overseeing the program was confident in her ability to undertake the coaching role the following year but was concerned about the time required to do this task yet still meet her other teaching requirements.

Discussion

This study provides evidence that structured intervention for reading at secondary school level can be effective for a range of students. Significant gains in reading level were achieved with students who had experienced a history of being unable to read with the consequent negative impacts on motivation to engage in learning that repeated failure engenders. The teaching staff reported that the coaching and mentoring were essential to the delivery and sustainability of the program and the structure of the program supported them to deliver instruction in a subject of which they had limited knowledge. Teachers noted other benefits to students outside of the *Reading Mastery* lessons, including students' confidence in reading and ability to access written material in other subjects.

There are, however, clear limitations to the study including the participant size of 59 and the single school context. In addition, the school's desire to have all students identified with reading levels less than Year 6 included in the program meant that we were unable to have a no-treatment group to provide

comparisons. Movement within the program occurred as students progressed from one level of the program to the next. These changes in groups and teachers were necessary to provide the best learning opportunities for the students, but made it difficult to isolate these factors from student performance and created some complexity with the data analysis. However the data indicated improvement over a range of different student categories, year levels, teachers and classrooms, with participation in the program the consistent factor. This minimised the likelihood of different explanations for the significant effects. While acknowledging the limitations, this research provides valuable information that can guide secondary schools in identifying and implementing appropriate reading interventions. The overall effect size of 1.13 is notable given Hattie's (2018, p. 1) recent update of Visible Learning meta-analyses suggesting that programs or influences on student achievement with effect sizes of 0.4 or greater have 'potential to accelerate student achievement' and effect sizes of 0.7 or greater have 'potential to considerably accelerate student achievement'.

Of particular importance is the finding that the chosen intervention was effective with all groups of students, with no significant differences between the ESU, Indigenous and 'other' students in the program, with only the EAL students showing a significant difference. Even for students from the ESU, inspection of Figure 4 indicates that although between baseline and the first assessment their performance fell slightly, they showed a larger rate of gain than the other groups between the second and third assessments. This indicates that they also were capable of accelerated learning rates and illustrates that the approach used in this study has potential applicability to all groups of students failing in literacy. Gains in comprehension were not as significant as word identification and word attack; however, this is not surprising given the reading ability of the students prior to the program. An inevitable consequence of poor reading skills is reduced practice in reading and understanding text, particularly for pleasure. Compared to students who read novels and other texts for pleasure, their experience of vocabulary and word meaning in context is inevitably limited and, consequently, limits comprehension. The research reported in the literature review highlighted that it is necessary for students to have strong foundational skills in order to develop good comprehension skills. The improvements shown in the Word Identification and Word Attack are the foundation for the development of Word Comprehension and Passage Comprehension.

The research also identified that the effective implementation of this program requires characteristics that have been identified as central to the success of educational programs, including the provision of a coordinator, the coaching of the staff delivering the program, the sharing of detailed data with the teaching staff to inform the instructional level for students, and the monitoring of lesson delivery to ensure fidelity. Families were engaged through delivery of an information session for parents and by sending a report to parents on their child's progress, including attendance, in Term 4. The data from attendance rates and learning outcomes indicate that increasing attendance rates would be likely to lead to significant improvements in reading and it is posited that making progress reports available to parents after the first Term in the program could assist with attendance and support for the student at home, as well as increasing the accountability of the teaching staff. The specific impact of this would need to be investigated in subsequent research.

While the project could be considered a success in terms of overall student improvement, the limited progress made by some students highlights the need for further research to identify the reasons for the variation in progress. Strategies to investigate in future research might include more flexible programs for those students who are regular non-attenders, building stronger partnerships with families to gain their support for the child's attendance and engagement, and other incentives for the students to engage in their education. Throughout the course of the research, it became evident from classroom observations and interviews with teaching staff and school leaders that school-wide approaches to improve the efficacy of subject specific reading instruction would benefit all students at the school. With the support of the lead researcher, the school has subsequently begun the implementation of explicit approaches to teaching in all subject areas, including the teaching of vocabulary as this underpins reading development at all levels (Connor, Morrison & Katch, 2004; Konza, 2014; Snowling, Gallagher & Frith, 2003). The school continues to pursue alternative programs for those students whose engagement and attendance at the school is so low that they are not present to benefit from the approaches mentioned above.

Overall, this research supports the efficacy of the Direct Instruction Reading Mastery program in improving secondary students' reading skills, but also highlights the complexity of assessing the impact of learning intervention in schools where the primary focus is on improving student outcomes not on research protocols. Ongoing research into approaches that support secondary students to attain the reading skills necessary to be successful contributors to the community is crucial and will ultimately benefit society as a

whole. More importantly, it will provide these students with skills that are necessary for positive life outcomes.

References

Australian Curriculum Assessment and Reporting Authority (ACARA). (2014). *Foundation to year 10 curriculum*. Retrieved from https://www.australiancurriculum.edu.au/

Australian Curriculum Assessment and Reporting Authority (ACARA). (2017). *NAPLAN achievement in reading, writing, language conventions and numeracy: National report for 2017*. Retrieved from http://www.nap.edu.au/results-and-reports/national-reports

Australian Curriculum Assessment and Reporting Authority (ACARA). (2018). *Technical and statistical information*. Retrieved from https://www.myschool.edu.au/media/1067/guide_to_understanding_icsea_values.pdf

Australian Institute of Health and Welfare. (2017). *Australia's welfare 2017: In brief* (Cat. no. AUS 215). Canberra, ACT: Author.

Barton, G. & McKay, L. (2016). Adolescent learners and reading: Exploring a collaborative, community approach. *Australian Journal of Language and Literacy, 39*(2), 162–175.

Bell, J. (2005). *Doing your research project. A guide for first-time researchers in education, health and social science. (4th ed.)*. Berkshire, England: Open University Press.

Biancarosa, C. & Snow, C.E. (2006). *Reading next – A vision for action and research in middle and high school literacy: A report to Carnegie Corporation of New York (2nd ed.)*. Washington, DC: Alliance for Excellent Education. Retrieved from https://www.carnegie.org/media/filer_public/b7/.../ccny_report_2004_reading.pdf

Blatchford, P., Bassett, P., Brown, P., Martin, C., Russell, A. & Webster, R. (2011). The impact of support staff on pupils' 'positive approaches to learning' and their academic progress. *British Educational Research Journal*, *37*(3), 443–464. Retrieved from https://www-jstor-org.ezproxy.ecu.edu.au/stable/25822379

Bonnor, C. & Shepherd, B. (2016). *School daze: What* My School *really says about our schools*. Retrieved from https://cpd.org.au/wp-content/uploads/2016/03/School-Daze-4.pdf

Borman, G.D., Hewes, G.M., Overman, L.T. & Brown, S. (2003). Comprehensive school reform and achievement: A meta-analysis. *Review of Educational Research*, *73*(2), 125–230. https://doi.org/10.3102/00346543073002125

Bost, L.W. & Riccomini, P.J. (2006). Effective instruction: An inconspicuous strategy for dropout prevention. *Remedial and Special Education, 27*(5), 301–311. doi: 10.1177/07419325060270050501

Caldwell, B.J. & Spinks, J.M. (2013). *The self-transforming school*. Abingdon, UK: Routledge. doi: 10.4324/9780203387986

Cantrell, S.C., Burns, L.D. & Callaway, P. (2008). Middle- and high-school content area teachers' perceptions about literacy teaching and learning. *Literacy Research and Instruction, 48*(1), 76–94. doi: 10.1080/19388070802434899

Carlisle, J.F., Cortina, K.S. & Katz, L.A. (2011). First-grade teachers' response to three models of professional development in reading. *Reading & Writing Quarterly, 27*(3), 212–238. doi: 10.1080/10573569.2011.560482

Carnine, D., Silbert, J., Kame'enui, E. & Tarver, S. (2004). *Direct instruction reading* (4th ed.). Upper Saddle River, NJ: Pearson.

Connor, C.M., Morrison, F.J. & Katch, L.E. (2004). Beyond the reading wars: Exploring the effect of child-instruction interactions on growth in early reading. *Scientific Studies of Reading, 8*(4), 305–336. doi: 10.1207/s1532799xssr0804_1

Corbin, J.M. & Strauss, A. (1990). Grounded theory research: Procedures, canons, and evaluative criteria. *Qualitative Sociology, 13*(1), 3–21. doi: 10.1007/BF00988593

Costa, A.L. & Garmston, R.J. (2002). *Cognitive coaching: A foundation for renaissance schools* (2nd ed.). Sacramento, CA: Christopher-Gordon.

Coughlin, C. (2011). *Research on the effectiveness of direct instruction programs: An updated meta-analysis*. Paper presented at the 37th Annual Convention of the Association for Behavior Analysis International, Denver, Colorado. Abstract retrieved from https://www.abainternational.org/events/program-details/event-detail.aspx?sid=13612&by=ByArea#s215_14

Daggett, W.R. & Hasselbring, T.S. (2014). *What we know about adolescent reading*. Rexford, NY: International Center for Leadership in Education. Retrieved from www.leadered.com/pdf/What_We_Know_About_Adolescent_Reading_2014.pdf

Edmonds, M.S., Vaughn, S., Wexler, J., Reutebuch, C., Cable, A., Tackett, K.K. & Schnakenberg, J.W. (2009). A synthesis of reading interventions and effects on reading comprehension outcomes for older struggling readers. *Review of Educational Research, 79*(1), 262–300. doi: 10.3102/0034654308325998

Eisenhardt, K.M. (2002). Building theories from case study research. In M.A. Huberman & M.B. Miles (Eds.), *The qualitative researcher's companion* (pp. 5–36). Thousand Oaks, CA: Sage.

Elkins, J. (2007). Learning disabilities: Bringing fields and nations together. *Journal of Learning Disabilities, 40*(5), 392–399. doi: 10.1177/00222194070400050201

Elks, S. & Ferarri, J. (2013, June 1). Cane-country schools teach a lesson in how to defy disadvantage. *The Australian*. Retrieved from http://www.theaustralian.com.au

Engelmann, S. & Carnine, D.W. (1982). *Theory of instruction: Principles and applications*. New York, NY: Irvington.

Engelmann, S. & Carnine, D.W. (1991). *Theory of instruction: Principles and applications*. Eugene, OR: ADI Press.

Forness, S.R., Kavale, K.A., Blum, I.M. & Lloyd, J.W. (1997). Mega-analysis of meta-analyses: What Works In Special Education And Related Services. *Teaching Exceptional Children*, *29*(6), 4–9. doi.org/10.1177/004005999702900601

Goss, P., Sonnemann, J., Chisholm, C. & Nelson, L. (2016). *Widening gaps: What NAPLAN tells us about student progress*. Carlton, VIC, Australia: Grattan Institute. Retrieved from http://apo.org.au/node/62241

Guthrie, J.T., Klauda, S.L. & Ho, A. (2013). Modeling the relationships among reading instruction, motivation, engagement, and achievement for adolescents. *Reading Research Quarterly, 48*(1), 9–26. Retrieved from www.jstor.org/stable/23343536

Hattie, J. (2009). *Visible learning: A synthesis of over 800 meta-analyses relating to achievement*. London, UK: Routledge.

Hattie, J. (2018). Visible learning plus: 250+ influences on student achievement [web page]. Available at: https://www.visiblelearningplus.com/content/research-john-hattie

Hempenstall, K. (2005). The whole language-phonics controversy: A historical perspective. *Australian Journal of Learning Disabilities, 10*(3–4), 19–33. doi: 10.1080/19404150509546797

Hempenstall, K. (2016). *Read about it: Scientific evidence for effective teaching of reading* (edited by Jennifer Buckingham). St Leonards, NSW, Australia: Centre for Independent Studies. Retrieved from http://www.cis.org.au/publications/research-reports/read-about-it-scientific-evidence-for-effective-teaching-of-reading/

Hiatt, B. (2013, August 22). The little school that could. *The West Australian*. Retrieved from http://au.news.yahoo.com/thewest/

Hiatt, B. (2015, December 9). Phonics, principals put schools ahead. *The West Australian*. Retrieved from https://au.news.yahoo.com/thewest

Holmes, V.M. (2009). Bottom-up processing and reading comprehension in experienced adult readers. *Journal of Research in Reading, 32*(3), 309–326. doi: 10.1111/j.1467–9817.2009.01396.x

Joseph, L.M. & Schisler, R. (2009). Should adolescents go back to the basics? A review of teaching word reading skills to middle and high school students. *Remedial and Special Education, 30*(3), 131–147. doi: 10.1177/0741932508315646

Kershaw, S. & Schatschneider, C. (2012). A latent variable approach to the simple view of reading. *Reading & Writing, 25*(2), 433–464. doi: 10.1007/s11145-010–9278-3

Kirschner, P.A., Sweller, J. & Clark, R.E. (2006). Why minimal guidance during instruction does not work: An analysis of the failure of constructivist, discovery, problem-based, experiential, and inquiry-based teaching. *Educational Psychologist, 41*(2), 75–86. doi: 10.1207/s15326985ep4102_1

Konza, D. (2014). Teaching reading: Why the 'Fab Five' should be the 'Big Six'. *Australian Journal of Teacher Education, 39*(12), 153–169. doi: 10.14221/ajte.2014v39n12.10

Konza, D. & Main, S. (2015). The power of pedagogy: When all else fails. *The International Journal of Learning: Annual Review*, 22, 9–29. doi: 10.18848/1447–9494/CGP/v22/48746

Louden, W. (2015). *High performing primary schools: What do they have in common?* Perth, WA: Department of Education Western Australia. Retrieved from http://www.education.wa.edu.au/home/detcms/cms-service/download/asset/?asset_id=16987548.

Love, K. (2009). Literacy pedagogical content knowledge in secondary teacher education: Reflecting on oral language and learning across the disciplines. *Language and Education, 23*(6), 541–560. doi: 10.1080/09500780902822942

Lyon, R.G. (2001). *Measuring success: Using assessments and accountability to raise student achievement*. Paper presented at the House Committee on Education and the Workforce, Subcommittee on Education Reform, 107th Congress. Retrieved from http://www.nrrf.org/lyon_statement3-01.htm

Marchand-Martella, N.E., Martella, R.C., Modderman, S.L., Petersen, H.M. & Pan, S. (2013). Key areas of effective adolescent literacy programs. *Education & Treatment of Children, 36*(1), 161–184. doi: 10.1353/etc.2013.0005

Marchand-Martella, N.E., Slocum, T.A. & Martella, R.C. (2004). *Introduction to direct instruction*. Boston, MA: Pearson.

McCutchen, D., Harry, D.R., Cunningham, A.E., Cox, S., Sidman, S. & Covill, A.E. (2002). Reading teachers' content knowledge of children's literature and phonology. *Annals of Dyslexia, 52*, 207–228. doi: 10.1007/s11881-002–0013-x

Meeks, L.J. & Kemp, C.R. (2017). How well prepared are Australian preservice teachers to teach early reading skills? *Australian Journal of Teacher Education, 42*(11), 1–17. doi: 10.14221/ajte.2017v42n11.1

Merga, M.K. (2016). What would make them read more? Insights from Western Australian adolescents. *Asia Pacific Journal of Education, 36*(3), 409–424. doi: 10.1080/02188791.2014.961898

Moats, L.C. & Foorman, B.R. (2003). Measuring teachers' content knowledge of language and reading. *Annals of Dyslexia, 53*(1), 23–45. doi: 10.1007/s11881-003–0003-7

Moon, B. (2014). The literacy skills of secondary teaching undergraduates: Results of diagnostic testing and a discussion of findings. *Australian Journal of Teacher Education, 39*(12), 111–130. doi: 10.14221/ajte.2014v39n12.8

Nagy, W., Berninger, V. & Abbott, R. (2006). Contributions of morphology beyond phonology to literacy outcomes of upper elementary and middle-school students. *Journal of Educational Psychology, 98*(1), 134–147. doi: 10.1037/0022–0663.98.1.134

Organization for Economic Cooperation and Development [OECD]. (2016). *PISA 2015 results: Excellence and equity in education, Volume I*. Paris, France: OECD Publishing. doi: 10.1787/9789264266490-en

Purdie, N. & Ellis, L. (2005). *A review of the empirical evidence identifying effective interventions and teaching practices for students with learning difficulties in Year 4, 5 and 6*. Retrieved from https://research.acer.edu.au/tll_misc/7

Quinn, M.M., Rutherford, R.B. & Leone, P.E. (2005). Youth with disabilities in juvenile corrections: A national survey. *Exceptional Children, 71*(3), 339–345. doi: 10.1177/001440290507100308

Reading Mastery (Signature Edition). (2008). New York, NY: McGraw-Hill Education.

Rowe, K. (2006). Effective teaching practices for students with and without learning difficulties: Issues and implications surrounding key findings and recommendations from the national inquiry into the teaching of literacy. *Australian Journal of Learning Disabilities, 11*(3), 99–115. doi: 10.1080/19404150609546813

Rowe, K. & National Inquiry into the Teaching of Literacy (Australia). (2005). *Teaching reading*. Camberwell, VIC: Australian Council for Educational Research (ACER). Retrieved from http://research.acer.edu.au/tll_misc/5

Ruppar, A., Bal, A., Gonzalez, T., Love, L. & McCabe, K. (2018). Collaborative research: A new paradigm for systemic change in inclusive education for students with disabilities. *International Journal of Special Education, 33*(3), 778–778.

Scammacca, N., K, Roberts, G., Vaughn, S. & Stuebing,

K.K. (2015). A meta-analysis of interventions for struggling readers in Grades 4–12: 1980–2011. *Journal of Learning Disabilities, 48*(4), 369–390. doi: 10.1177/0022219413504995

Scarborough, H.S. (2001). Connecting early language and literacy to later reading (dis)abilities: Evidence, theory, and practice. In S. Neuman & D. Dickinson (Eds.), *Handbook for research in early literacy* (pp. 97–110). New York, NY: Guilford Press.

School Curriculum and Standards Authority. (2014). Online Literacy and Numeracy Assessment (OLNA) [Prezi slide presentation]. Retrieved from https://senior-secondary.scsa.wa.edu.au/assessment/olna

Slavin, R.E., Cheung, A., Groff, C. & Lake, C. (2008). Effective reading programs for middle and high schools: A best-evidence synthesis. *Reading Research Quarterly, 43*(3), 290–322. doi: 10.1598/RRQ.43.3.4

Snowling, M.J., Gallagher, A. & Frith, U. (2003). Family risk of dyslexia is continuous: Individual differences in the precursors of reading skill. *Child Development, 74*(2), 358–374. doi: 10.1111/1467–8624.7402003

Stevenson, N.A. & Reed, D.K. (2017). To change the things I can: Making instruction more intensive. *Intervention in School and Clinic, 53*(2), 74–80. doi: 10.1177/1053451217693365

Stockard, J. & Wood, T.W. (2016). The threshold and inclusive approaches to determining 'best available evidence': An empirical analysis. *American Journal of Evaluation, 38*(4), 471–492. doi: 10.1177/1098214016662338

Stockard, J., Wood, T.W., Coughlin, C. & Rasplica Khoury, C. (2018). The effectiveness of direct instruction curricula: A meta-analysis of a half century of research. *Review of Educational Research, 88*(4), 479–507. doi: 10.3102/0034654317751919

Suggate, S., Schaughency, E., McAnally, H. & Reese, E. (2018). From infancy to adolescence: The longitudinal links between vocabulary, early literacy skills, oral narrative, and reading comprehension. *Cognitive Development, 47*, 82–95. doi: 10.1016/j.cogdev.2018.04.005

Swanson, H.L. (1999). Reading research for students with LD: A meta-analysis of intervention outcomes. *Journal of Learning Disabilities, 32*(6), 504–532. doi:10.1177/002221949903200605

Teacher Education Ministerial Advisory Group. (2015). *Action now: Classroom ready teachers report*. Retrieved from https://docs.education.gov.au/system/files/doc/other/action_now_classroom_ready_teachers_accessible.pdf

Urban, R. (2019, March 19). Keys to school success revealed: poor schools need strong teachers. *The Australian*. Retrieved from https://www.theaustralian.com.au/national-affairs/education/keys-to-school-success-revealed-poor-schools-need-strong-teachers/news-story/916b481721627b8aaacf6b3fbc61b6fa

Vaughn, S., Denton, C.A. & Fletcher, J.M. (2010). Why intensive interventions are necessary for students with severe reading difficulties. *Psychology in the Schools, 47*(5), 432–444. doi: 10.1002/pits.20481

Vaughn, S., Roberts, G., Wexler, J., Vaughn, M.G., Fall, A.-M. & Schnakenberg, J.B. (2015). High school students with reading comprehension difficulties: Results of a randomized control trial of a two-year reading intervention. *Journal of Learning Disabilities, 48*(5), 546–558. doi: 10.1177/0022219413515511

Wang, Z., Sabatini, J., O'Reilly, T. & Weeks, J. (2019). Decoding and reading comprehension: A test of the decoding threshold hypothesis. *Journal of Educational Psychology, 111(3), 387–401*. doi: 10.1037/edu0000302

Washburn, E.K., Joshi, R.M. & Binks Cantrell, E. (2011). Are preservice teachers prepared to teach struggling readers? *Annals of Dyslexia, 61*(1), 21–43. doi: 10.1007/s11881-010–0040-y

Wigfield, A., Gladstone, J.R. & Turci, L. (2016). Beyond cognition: Reading motivation and reading comprehension. *Child Development Perspectives, 10*(3), 190–195. doi: 10.1111/cdep.12184

Woodcock, R.W. (2011). *Woodcock reading mastery tests – Third edition (WRMT-III)*. Bloomington, MN: Pearson.

Yin, R.K. (2009). *Case study research: Design and methods* (4th ed.). Thousand Oaks, CA: Sage.

Ziomek-Daigle, J. & Andrews, P.G. (2009). Dropout prevention in the middle grades. *Middle School Journal, 40*(5), 54–60. doi: 10.1080/00940771.2009.11461694

Susan Main, Ph.D., is a Senior Lecturer in Education at Edith Cowan University in Perth, Western Australia where she has delivered units in Educational Psychology, Special Education, Behaviour Management, Literacy and Work Place Learning to undergraduate and post graduate pre-service teachers. Her teaching and research interests include preparing pre-service and in-service teachers to teach children with diverse abilities, including evidence-based approaches to literacy instruction, managing challenging behaviour, and using technology to facilitate learning. Susan is the current President of the Western Australian chapter of the Australian Association of Special Education and a member of the InSpEd Panel of Experts.

Margie Backhouse M.Ed., is an experienced primary school teacher who is currently a Teaching and Learning Coach working with Graduate Teachers for the Department of Education, Western Australia. Recently, Margie held positions at Notre Dame University and Edith Cowan University, specialising in learning difficulties, and has also worked as a Literacy Specialist for the Dyslexia SPELD Foundation, WA. Margie's special research interests include teaching children to read in the early years and improving spelling practices for middle and upper primary teachers, particularly in the area of morphology.

Robert Jackson, Ph.D., is Adjunct Associate Professor at Curtin University in Perth and a private consultant in education. Before commencing work as a private consultant he was Associate Professor of Education at Edith Cowan University specialising in the area of disability and inclusion and now works across Australia with families and schools on the inclusion of students with disability in mainstream classes. He is Secretary of the Australian Alliance for Inclusive Education. He has been involved in the teaching of reading at Government and Private High Schools for nearly two decades.

Susan Hill, Ph.D., is a Senior Research Fellow in the School of Education at Edith Cowan University. Before moving into research she taught in secondary schools in Perth and Sydney. Susan obtained her PhD in Education from the University of Manchester where she worked on a range of projects in the Choices and Chances in Education and Employment Programme. At ECU, Susan has also worked as a Research Consultant and Research Development Advisor providing advice and input to academic staff and postgraduate research students on research design, methods, data analysis and academic publication.