Action Research Project

Abstract

Many students in the early years of school have difficulty reading accurately at the word and prose level. It has been found that the most common cause of these difficulties in attaining early word reading skills is weakness in the ability to process the phonological features of language (Liberman, Shankweiler and Liberman 1989). Current research findings shows that Phonological awareness skills are teachable (Adams, 1990; Ball & Blachman, 1988, 1991; Brady, Fowler, Stone, & Winbury, 1994; Cunningham, 1990; O'Connor et al., 1995; National Reading Panel, 2000; Smith et al., 1998, cited in Oudean, 2003) and instruction often results in significant gains in phonological awareness skills for most children and subsequently improved reading. (Ball & Blackman, 1992; Cunningham, 1990; Fox & Routh, 1984; Davidson & Jenkins, 1994; O'Connor et. al., 1996; Torgesen et al., 1992, cited in Oudean, 2003). Further to this much research has shown the positive links between teaching rime units and improved student reading ability (Bowey & Hansen, 1994, Goswami, 1993, Goswami & Mead, 1992; Kirtley, Bryant, McClean & Bradley, 1989; Moustafa, 1995; Treiman & Zukowski, 1996, cited in Cunningham, Erickson, Spadorica, Koppenhaver, Cunningham, Yoder and McKenna, 1999).

The hypothesis of this study is that explicitly teaching the strategy of segmenting and blending one syllable words (onset and rime) with Year one students with reading difficulties, improves their reading accuracy at word and prose level.

The participants in this study are ten Year 1 students who have been identified with reading difficulties. Five students received intervention; the Teaching Group and five students did not receive any intervention; the control group. Ten 40 minutes lessons were conducted during their regular literacy block over a two week period.

The results indicate that on average the Teaching Group improved greatly in reading accuracy at both the isolated word and prose level. In comparison the Control Group showed some growth in reading accuracy at word and prose level but not to the same extent as the Teaching Group. The Teaching Group and Control Group both showed improvements in reading rates but the Control Group showed a greater growth. Results support the hypothesis, reinforcing that children with reading difficulties can show growth in reading accuracy when explicitly taught the strategy of segmenting and blending.

The study findings provide support for the teaching of phonological awareness skills in particular segmenting and blending through onset and rime to students who are at – risk with learning to read.

Introduction

Many students in the early years of school have difficulty reading accurately at word and prose level. Current reading research has shown convincing evidence that children who start off poorly in reading usually remain deficient readers throughout their schooling and beyond (Adams, 1990; Juel, 1988; Stanovich, 1986; Torgesen & Burgess, 1998, cited in Pullen, Lane, Lloyd and Nowak 2005). Pullen, Lane, Lloyd and Norwak (2005) believe that this impact in early reading failure supports the need for early intervention for struggling readers. Further to this many researchers argue that to insure early success in reading, beginning readers and especially struggling beginning readers, need to be provided with both explicit and systematic instruction (Adams, 1990; Lane, 1994; National Reading Panel, 2000; Snow, Burns, & Griffin, 1998, cited in Pullen et. al., 2005). Gaskin, Ehri, Cress and Donnelly (1996, p.326) support this stating 'these children will not acquire any necessary skills for reading words unless they are directly taught that skill or knowledge and receive sufficient opportunities to practice it'.

There has been much research done in the past 20 years examining the relationship between reading difficulties and phonological awareness. Phonological awareness comprises of phonological knowledge and phonemic knowledge. It is essential to read words because individuals need to match written word with how it is said. Lane, Pullen, Eisele & Jordan (2002) describe phonological awareness as an umbrella that comprises 4 levels: word level, syllable level, onset and rime level and phoneme level. Further to this Wagner and Torgesen (1987) (cited in Felton 1993, p. 583) state that 'phonological awareness is one type of phonological processing that involves metalinguistic awareness of

the speech – sound structure of language, and it is often measured by tasks that require segmentation of words into sounds'. Phonological awareness has been seen by many researches as an essential stage in literacy development. Muter & Snowling, (1998); Torgesen, Wagner, & Rashotte, (1994) (cited in Crim,Hawkins, Thorton, Boon Rosof, Copley and Thomas, 2008, p. 18) believe that 'this early stage forms the foundation of learning, as the literacy skills developed in early childhood are strongly linked to a child's future reading success'. This is supported by Liberman, Shankweiler and Liberman (1989) who state that the most common cause of difficulties in acquiring early word reading skills is weakness in the ability to process the phonological features of language. It has been found in many studies with varied student groups, that phonological awareness instruction significantly improved the students' reading skills, including word reading, phoneme blending, and segmenting (Chard, Simmons, & Kameenui, 1998; Foorman, Francis, Beeler, Winikates, & Fletcher, 1997; Jackson, Paratore, Chard, & Gamick, 1999, cited in Pullen et. al., 2005, cited in Pullen et. al., 2005). Torgesen, Wagner & Rashotte (1994) (cited in Crim et. al., 2008) in their research concluded that although there are many variables that contribute to a child's ability to read, phonological awareness is the skill that is most closely related to the child's future reading success. Further to this, Pullen and Justice (2003) (cited in Crim et. al., 2008) found that there is evidence to support that phonological awareness is essential for the development of decoding skills**.** Children with strong phonological awareness can detect, match, blend, segment and manipulate speech sounds. Having these skills with the sounds of spoken language allows children to learn more readily how to use these skills to decode print (Lane, Pullen, Eisele and Jordan, 2002). Many researchers believe that phonological awareness skills are teachable (Adams, 1990; Ball & Blachman, 1988, 1991; Brady, Fowler, Stone, & Winbury, 1994; Cunningham, 1990; O'Connor et al., 1995; National Reading Panel, 2000; Smith et al., 1998, cited in Oudeans, 2003). It has been shown that instruction in phonological skills often results in significant gains in phonological awareness skills for most children. Those who received phonological awareness instruction showed increases in their skills and had higher scores in reading achievement than children who didn't receive phonological awareness instruction (Ball & Blachman, 1992; Cunningham, 1990; Fox & Routh, 1984; Davidson & Jenkins, 1994; O'Connor et al., 1996; Torgesen et al., 1992 cited in Oudeans, 2003).

Vellutino and Scanlon (1987) add that within phonological awareness it is the lack of phonemic awareness that is the major obstacle for some children in learning to read. Adams (1990) and Stanovich (1986) (cited in Chard and Dickson, 1999) agree believing it is a child's phonemic awareness when beginning school that is most closely related to their success in learning to read. Munro (1998) further supports this stating that the children's level of phonemic knowledge has an influence on their ability to learn to recognise automatically written words. Phonemic awareness is one aspect of phonemic knowledge. It is an individual's awareness of the individual sound patterns in speech (Munro, 1998). Munro (1998) believes that the individual sounds and sound patterns that children can recognise in spoken words determine largely the written letter groups they can learn to automatically recognise. Munro (1998) further states that many readers display reading disabilities because their phonological knowledge restricts their ability to learn written word patterns (orthographic knowledge). For these students a necessary area of teaching is phonological knowledge. Phonological knowledge is defined as the knowledge of sounds, patterns of sounds and groups of sounds (Munro, 1998).Teaching phonological knowledge provides the foundations necessary for increasing their written word knowledge (orthographic). Two processes that are important for children to master are segmenting and blending. Students need to be capable in analysing sounds in words and also have the ability to synthesis the sounds into a word. Hempenstall (2002) believes that segmenting and blending are two phonemic awareness processes that are most closely involved with the reading process and are directly related to teaching letter – sound processes. These skills can impact a student's ability to read accurately and efficiently. According to O'Connor, Notairi – Synerson & Vadasy (cited in Chard and Osborn, 1999) some children have difficulty in segmenting the sounds in words and then blending these sounds back to make a word. Children and especially students with reading difficulties require explicit teaching of segmenting and blending to improve their reading accuracy.

One natural sound unit that can be used to teach segmenting and blending is rime. Adams (1990) and Goswami & Mead (1992) (cited in Lane, Pullen, Eisele and Jordan, 2002) consider onset and rime segmentation skill as an essential component of phonological awareness. Rime is the part of a syllable which consists of its vowel and any consonant sounds that come after it (the – ot of pot). The onset is the initial constonant or cluster before the vowel (the p of pot or the pl of plot) (Johnston, 1999). The study of phonograms, word families or onset and rime is not a new idea but it has had renewed interest lately. Research over the last 25 years has confirmed that children are more successful and find it less difficult to break apart the onset and rime in a word than to segment them into individual phonemes or break it in another place (Cunningham 1999 and Treiman, 1985, cited in Johnston 1999).

Wylie and Durrell (1970) (cited in Johnston 1999) reported that children learn words easily by the use of "rhyming phonograms" rather than studying complicated decoding rules which have many exceptions. Wylie and Durrell (1970) (cited in Johnston 1999, pg 66) further state that 'asking young readers to isolate the vowel or to use the vowel to sound their way through a word letter by letter, applying beginning phonics rules, is asking them to do something that is very abstract and difficult, and often impossible'. It is suggested that the teaching of onset and rime offers a friendly route to phonics understandings and allows students to work in context with sounds in useful and easily perceived units (Johnston, 1999). Another reason Wylie and Durrell (1970) and Adams (1990,) (cited in Johnston 1999) believe onset and rime learning is easier is that pronunciation of vowels is more stable within a rime family than across rime families. Much research has shown the positive links between teaching rime units and improved student reading ability (Bowey & Hansen, 1994, Goswami, 1993, Goswami & Mead, 1992; Kirtley, Bryant, McClean & Bradley, 1989; Moustafa, 1995; Treiman & Zukowski, 1996, cited in Cunningham, Erickson, Spadorica, Koppenhaver, Cunningham, Yoder and McKenna, 1999). Teaching onset and rime through the use of Wylie and Durrell 's high frequency or dependable rimes has been seen as the best way to teach segmenting and blending as they are the basis for nearly 500 primary words (Johnston, 1999). Frye (1998) (cited in Johnston, 1999) states that 38 phonograms can generate 654 one – syllable words and that familiar rimes are also the foundation for syllabic chunks that occur in thousands of multisyllabic words too.

In teaching onset and rime Johnston (1999) believes that the most important factor for the young student is coming to understand that the rime or vowel chunk is a dependable and generative unit for reading and spelling words. Further to this Johnston (1999, p. 67) states that well – timed instruction of onset and rime can help children 'solidify tentative understandings, sort out current confusions, and move along to new understandings in the most efficient manner'. In the teaching of onset and rime Johnston (1999) suggests teaching one rime unit at a time as it stabilizes children's understanding of rhyme and gives them added visual support to see that rhyming words not only sound alike but can also look alike. It also emphasises initial sounds, which are the only cue needed to discriminate between the words as children try to read, spell, or match words to pictures. Johnston (1999) also recommends that in order to focus children's attention on the rime itself they need to be challenged to listen for, and address, the sound at the end of the word through activities which compare and contrast different rimes. This current research project has used these findings in planning the structure of the intervention program, focussing on one rime unit in most lessons but having two review sessions, one half way and the other at the end to compare and contrast the endings of rimes. Morris (1992) (cited in Johnston, 1999) believes that it is not necessary to study every common phonogram with every child as once the children have become proficient at "chunking" or identifying rimes and using them to read and spell novel words, they will most likely begin to use rimes at a implied or innate level. Johnston (1999) also believes that the instructional activities used to teach onset and time should be "hands – on", where children actively explore words through talking, sorting, searching, writing and reading to make discoveries about words in context. Johnston (1999) also believes that timing is likely to be the most important component and this relies entirely upon the well – informed judgement of the classroom teacher. Johnston (1999) states that instruction which is sensitive to children's development and targets their "zone of proximal development" (Vygotsky, 1962, cited in Johnston, 1999) will lead to efficient and successful results.

Few early intervention programs target directly the explicit teaching of rime units. The present study aims to extend earlier research by examining the influence of the phonological awareness skill of segmenting and blending has on learning to read accurately at both word and prose level. This study also seeks to see if the factors of ESL, gender and earlier intervention have an impact on results.

Hypothesis:
Explicitly teaching Year One students with reading difficulties the strategy of segmenting and blending one syllable words (onset and rime) leads to an improvement in reading accuracy at both the word and prose level.

Method

Design:

The study uses a naturalistic case study OXO (assess, teach, assess) design. A problem for a group of students with reading difficulties is identified, strategic plan of action devised to address the problem and data collected to analyse the effects the strategy has on students. The study also has an OO (Assess, Assess) design group, to compare pre and post testing results with the OXO group. All participants are pre tested, the Teaching Group taught onset and rime

units and Control Group not receiving any intervention. All participates are then post tested and the gain in decoding words in isolation and prose is measured. This study measures the gains made by group of Year One students given explicit instruction in segmenting and blending compared to a control group. For the purpose of this research project the participants' in the OXO design will be referred to as the 'Teaching Group' and the participants' of the OO design will be referred to as the 'Control Group'.

Participants:

The participants are 10 students from two different Year One classes that have a history of reading difficulties. All students attend an average sized primary school in the eastern suburbs of Melbourne with a diverse mix of cultures and middle socio -economic status. The school implements a structured Literacy program based on the CLaSS Literacy model and plans with the standards contained in the Victorian Essential Learning Standards.
The students were chosen using CEO baseline literacy data which identified them as 'at risk/below average' in reading using CEO benchmarks (see Table 1). The students Mid Year PM Benchmark Text Level assessment (Nelson, 2000), VELS Reading Report mark and teachers anecdotal notes and observations were also used to support student selection. From Table 1 it can be seen that the 10 students have been placed into two groups; 5 students in the Control Group (Students F, G, H, I, J) and 5 students in the Teaching Group (Students A, B, C, D, E) who are receiving explicit teaching of onset and rime units. In the two groups there is an equal amount of ESL students (1 in the Control Group and 1 in the Teaching Group), boys and girls (3 boys and 2 girls in the Control Group and 3 boys and 2 girls in the Teaching Group) and students receiving reading recovery (2 in the Control Group and 2 in the Teaching Group). These groups are selected this way to mirror the knowledge, characteristics and exposure to intervention and to minimise the variables in this study. They were also chosen to analyse if any of these variables impact on results. A control Group and Teaching Group have been used to support that the specific teaching of segmenting and blending through onset and rime word units is the variable that impacts reading accuracy.

Name	Control = 0 Teaching=1	Age in MONTHS	Gender 0=Male 1= Female	Years of Schooling	ESL No=0 Yes=1	LNSLN funding 0=SLD 1=ID 2=Asp N/A	Earlier Intevention No=0 RR=1	Word Test March 2011	Text Level March 2011	BURT Test March 2011	EMA No=0 Yes=1
A	1	7 years	**1**	2	0	N/A	1	1	0	4	0
B	1	7 yrs, 4 mths	**0**	2	1	N/A	0	11	3	12	0
C	1	7 yrs, 4 mths	**0**	2	0	N/A	1	12	6	14	0
D	1	7 yrs, 1 mth	**1**	2	0	N/A	0	12	9	19	0
E	1	6 yrs, 5 mths	**0**	2	0	N/A	0	10	8	16	0
F	0	6 yrs, 6 mths	**0**	2	0	N/A	0	5	1	8	0
G	0	7 years	**0**	2	0	N/A	1	10	6	18	0
H	0	7 yrs	**0**	2	0	N/A	1	12	6	20	0
I	0	6 yrs, 11 mths	**1**	2	0	N/A	0	10	10	20	0
J	0	6 yrs, 10 mths	**1**	2	1	N/A	0	6	9	16	0

Table 1: Participants Data

Materials:

<u>Assessment Materials:</u>

The following materials were used in the assessment tasks:

Word reading Tasks:

Rime Units Test Dalheim, B (2004)

This test is at word reading level and requires the students to read 147, three, four and five letter words with 38 dependable rimes as accurately as they can. This test was used pre test to identify which rime unit words students are able and unable to accurately read and the strategies they use. The pre and post test data was also analysed to measure the amount of growth in reading words in isolation accurately.

Phonological reading tasks:

Sutherland Phonological Awareness Test Revised Neilson, R (2003) Form A (Pre Test) and Form B (Post Test)

This test was chosen as it assess' the students phonological awareness ability. It identifies the students ability to count syllables in words, detect and produce rhyme, indentify initial and final sound, word segmentation and blending, deletion of initial and second phoneme and finally nonsense word reading and spelling. It provided a snap shot of their phonological knowledge and their point of need – where they were in phonological development and the growth they have shown in phonological knowledge development. The areas of onset Id, segmenting and blending, non word reading and non word spelling were particularly analysed in this research as these areas related most closely to the hypothesis. Non word reading and non word spelling areas were also used to measure the growth in reading and spelling accuracy of nonsense words.

Prose Reading Tasks:

Neale Analysis of Reading Ability Third Edition Neale, M (1999) Form 1 (Pre Test) and Form 2 (Post Test)

This test was used to measure the students reading accuracy, rate and comprehension in reading at prose level. This test could be considered by some researchers as a blunt instrument and the Reading Progress Test (*Vincent, Crumpler and De la Mare, 1996)* would have been a more rigorous instrument to use but the Neale Analysis of Reading Ability Test was used as the Reading Progress Test was not accessible.

Rapid Naming Ability:

Rapid Naming Ability Test – Letters and Numbers, Munro, J

This test measures the time it takes for students to read as quickly and as accurately as they can some letters of the alphabet and numbers. It was used to measure the students ability to rapidly read/name letters and numbers (RAN).

Teaching Materials:

The following materials were used in the teaching tasks:

Flashcards

Two sets of flash cards were made for rime words taught. One set was written with highlighted onset and rime and these were cut up and used in word blending activities. The second set of flashcards was used for the reinforcement games.

Onset and Rime Games and Wheel

Cherry Carl (2009) http://www.wordway.us.com/

These games were used to practise segmenting and blending words into onset and rime and used for reinforcement games.

Easy Teach Software on Interactive Whiteboard.

Students used the literacy toolbox software to manipulate (segment) and blend words on the Interactive Whiteboard. Students also used the speech icon to hear the onset and rime in isolation and then blended.

Sentence Strips

Sentence strips were made by the teacher and students each lesson. Students choose one word from the rime unit and wrote a sentence they said orally first onto the sentence strip. These sentence strips were reused to reinforce and practice reading rime words in context.

Rime Unit Lesson Text

These texts were devised by the teacher and contained the rime units used in the session. They were written by the teacher at a Year 1 level using the Fry Readability Procedure. See Appendix 3 for example of text used.

Procedure:

Students were pretested using the Sutherland Phonological Awareness Test Revised (SPAT – R) (2003), RIME Units Test (2004), Neale Analysis of Reading Ability Test (1999) and Rapid Naming Ability Test in the week prior to teaching. Each student was withdrawn from the classroom for testing and each test was conducted in the order stated above throughout the week.

The pre tests were analysed to see the level of phonological awareness they had, types of words they had difficulty reading and the strategies they use. Each test was tested and analysed using the procedures set out in the teaching manuals of each test.

The Rime Units Test Pre test data was analysed to find the type of words and rime units most students in the Teaching Group had difficulty reading and these types of words and rime units were used in the Teaching lessons. See Appendix 4 for the table used to analyse the Rime Pre Test. Table 11 demonstrates that the students in Teaching Group had the most difficulty in four and five letter words therefore mostly three letter rime units with 1 and 2 letter cluster onsets are being explicitly taught and tested in this current research. It is important to note that some of the words used in teaching sessions are from the Rime Unit tests. It is not the intention to teach to the test and it needs to be mentioned that only 10 out of the 38 rimes are being taught. Results in these 10 rimes however need to be considered and improvements in results in all rimes need to be achieved to represent reading improvement of words in isolation. See Table 2 for units chosen and the sequence of teaching.

Lesson	Rime Unit	Words to Focus on
1	**aw**	raw, saw, jaw, paw, thaw, draw, claw.
2	**ack**	back, pack, sack, black, smack, crack, snack, track
3	**ick**	sick, lick, tick, pick, kick, brick, trick, thick
4	**eat**	heat, seat, neat, meat, beat, cheat, treat, wheat
5	**Half way review of first 5 rime units together**	
6	**ain**	pain, rain, train, chain, brain, drain, stain, grain
7	**ice and ight**	light, night, fight, tight, right dice, mice, rice, price, slice, twice
8	**oke**	poke, joke, woke, broke, choke, smoke, spoke
9	**ame and ale**	game, same, name, flame whale, sale, tale, gale, male
10	**Review all words**	

Table 2: Rime units selected and taught and words used

Following the pre testing the teaching group commenced ten, 40 minute sessions on a daily basis in the literacy block time. *Teaching was done both within the classroom and withdrawn from class together.*

The first four lessons consisted of explicit instruction in phonological awareness of four, two and three-letter rime units. Each unit was introduced in each session with daily revision of previous session's unit. Each day students were asked to identify the rime unit to be learnt through images on flash cards, suggest rhyming words related to each rime unit and complete blending and segmenting activities using a range of resources such as magnetic letters, flash cards and interactive whiteboard software. Students were then modelled to say one chosen rime word into a

sentence and write this sentence on a sentence strip. The students reread their sentence and shared it with the group and then read a prose with focused rime unit words within to practise reading at prose level. Each session concluded with the students articulating their new learning's and how they can apply it in their reading.
Lesson 5 consisted of revision of the first 4 rime units and Lesson 10 consisted of revision of all 10 rime units taught, to reinforce their learning and make links that the strategy can be applied to all rime units. In lessons 6 – 9 the same structure was used but the students were presented with more difficult rime units and in half the sessions multiple (2) rime units were taught. See Appendix 2 for an example of a detailed explanation of a lesson.

These 10 lessons were developed and conducted using the 'Model of Teaching and Learning' developed by Collins, Brown and Newman (1989) (as cited in Munro, 2011) in which teacher support was gradually decreased and student involvement increased during and over the 10 sessions. There was a set of responsibilities for both the teacher and students throughout the 10 lessons. In the beginning of the session and in the first four sessions the teacher modelled the actual task and how it was to be completed. The teacher then once students were ready acted in a coaching role and guided, prompted and provided feedback whilst the students were engaged in the tasks. Towards the end of the 10 sessions the teacher acted as a scaffold and provided some cues to assist the students to recall how to complete the task. These cues occurred less often and were faded out as the students were able to increasingly complete the task independently. The students also had responsibilities throughout the 10 sessions to articulate what they had learnt and when they can use what they have learned. They were also asked to reflect on what they have learned focusing on identifying what they know now that that they did not know before and finally were encouraged to consider how they can use what they have learned in new tasks and contexts.

At the conclusion of the 10 lessons all 10 students (Teaching Group and Control Group) were post tested the week after the Teaching Groups final lesson. Post testing data was tested and analysed using procedures set out in the teaching manuals of each test. The SPAT-R was analysed through finding the 'groups' raw scores in accordance with the SPAT-R Manual (Neilson, 2009) calculating the number of items correctly answered out of a possible 60. The groups' 'Raw Score Group Mean' was found by adding the groups' raw score results (out of a possible 60) and finding the average. The groups' 'Percentile Ranking' was scored in accordance with the percentile equivalents provided in the SPAT-R Manual (Neilson, 2009). The Neale was analysed through finding the 'groups' raw scores in accuracy, comprehension and rate in accordance with the Neale 3rd Edition Manual (Neale, 1999). The groups' 'Raw Score Group Mean' in accuracy, comprehension and rate was found finding the average of the groups' total raw score in each of the areas. The Neale was also analysed using the stanine, percentile, performance descriptor and reading age equivalents found in the Neale 3rd Edition Manual (Neale, 1999). In analysing the Rime Unit Test all students raw scores were found by scoring 1 point for every word they read correctly out of a possible 147 items. These results were analysed finding the raw scores and percentages. They were also divided into 3 groups for analysis: 3 letter, 4 letter and 5 letter words. Each groups' 'Raw Score Mean' was found by adding up the individuals raw scores and finding their average. Finally the Rapid Naming Ability Test (Munro) was analysed through recording the time it took for the student to read the letters and then numbers in two trials and then finding their average score, in accordance with the Rapid Naming Ability Rest instructions. The groups' 'Raw Score Group Mean' was found by adding the groups average score times and finding the total average. The variables: ESL, gender and earlier intervention (reading recovery) were also analysed the same way to see if they have any impact on reading accuracy at isolated word and prose level.

The aim of this research is to see the impact teaching segmenting and blending has on reading accuracy. To analyse if the prediction is accurate the student's growth has been measured to find a true indication of reading improvement at isolated word and prose level from pre test to post test data. The students growth was calculated by using the percentage increase formulae: Post Score – Pre Score divided by Pre Score x 100. For example if the student scored 5/10 in pre test and 10/10 in post test, 10 – 5 = 5. 5 divided by 5 = 1 x 100 = 100. This indicates that the student showed 100% growth in their post test. This way was used as it shows the amount of growth the student has made not just the increase in the score. In the example given by only finding % difference in the score it only reflects a 50% difference and doesn't represent the great growth the student showed doubling their score as percentage increase does.

Results

From Table 3 it can been seen that data collected indicates that Teaching Group students showed an improvement in all areas and more growth in reading accuracy at isolated word and prose level than the Control Group.

	Control = 0 Teaching=1	Attendance No. of sessions	SPAT PRE RAW	SPAT POST RAW	SPAT PRE PERCILE	SPAT POST PERCILE	RIME PRE RAW	RIME POST RAW	RIME PRE %	RIME POST %	NEALE PRE Accuracy Raw	NEALE POST Accuracy Raw	NEALE PRE Accuracy Percentile	NEALE POST Accuracy Percentile	NEALE PRE Accuracy Stanine	NEALE POST Accuracy Stanine	NEALE PRE Comprehension Raw	NEALE POST Comprehension Raw	NEALE PRE Comprehension Percentile	NEALE POST Comprehension Percentile	NEALE PRE Comprehension Stanine	NEALE POST Comprehension Stanine	NEALE PRE Rate Raw	NEALE POST Rate Raw	NEALE PRE Rate Percentile	NEALE POST Rate Percentile	NEALE PRE Rate Stanine	NEALE POST Rate Stanine	RAN Letter PRE	RAN Letter POST	RAN Number Pre	RAN Number Post
A	1	10	34	43	25	70	64	114	44	78	6	23	7	46	2	5	0	5	1	31	1	4	24	17.2	28	12	4	3	47	44	60.9	51
B	1	10	32	45	23	77	53	121	36	82	11	15	16	26	3	4	4	7	19	36	3	4	43	18	56	15	5	3	40	39	41.2	40
C	1	10	38	50	41	86	65	132	44	90	13	20	23	40	4	4	3	8	10	40	2	5	15	14.4	12	7	3	2	46	44	64	59
D	1	10	42	53	64	93	114	128	78	87	19	26	33	53	4	5	6	9	27	47	4	5	21	27	24	33	4	4	39	37	44.2	40
E	1	10	44	56	70	99	114	144	78	98	21	30	37	60	4	6	7	7	30	36	4	4	19.3	65	21	90	3	8	35	30	40	37
F	0	0	32	40	23	59	51	55	35	37	15	17	27	35	4	4	5	6	24	34	4	4	36	32	46	41	5	5	42	41	49.7	49
G	0	0	49	41	83	59	68	87	46	59	12	14	19	20	3	3	8	3	34	11	4	3	15.2	42	12	60	3	6	37	36	36.9	38
H	0	0	28	36	17	38	42	50	29	34	14	15	27	26	4	4	2	3	10	11	2	3	48	64	64	89	6	7	33	33	35.4	34
I	0	0	31	32	23	19	28	49	19	33	12	12	19	16	3	3	4	4	19	23	3	3	19	20	21	19	3	3	41	42	55.6	56
J	0	0	41	37	57	41	61	58	41	39	11	12	16	16	3	3	3	4	10	23	2	3	37	75	48	92	5	8	33	34	39.4	39

Table3

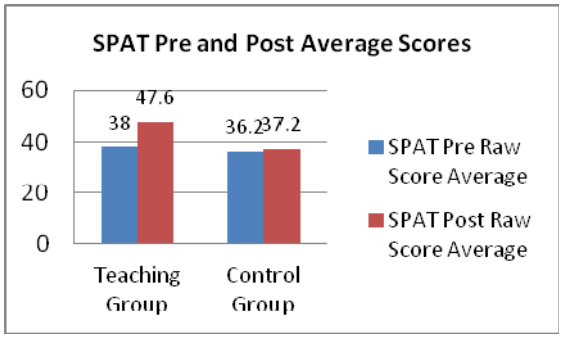
Students performance at group and individual level is described in four sections:

1. Phonological Awareness – Sutherland Phonological Awareness Test Revised (SPAT - R)
2. Isolated Word Reading – Rime Units Test
3. Prose Level Reading – Neale Analysis of Reading Ability: Accuracy, Comprehension and Rate
4. Rapid Automatic Naming – Rapid Naming of Letter and Number Test

In each section variables of ESL, gender and earlier intervention have also been described.

Sutherland Phonological Awareness Test Results

Group Results



Graph 1

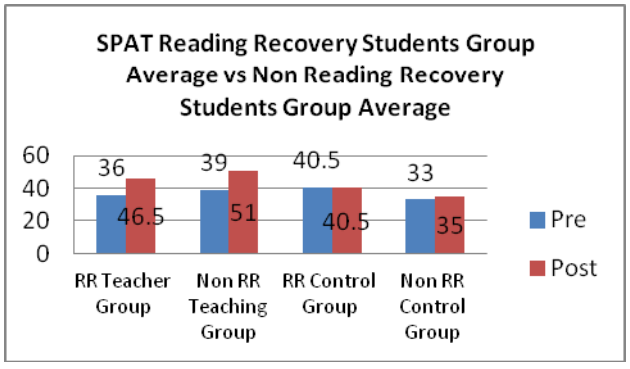
In phonological results, Graph 1 shows that the Teaching Group and Control Group began with similar SPAT pre test raw score averages, with the Teaching Groups pre test raw score average 1.8 higher than the Control Groups. The Teaching Group however had the highest average post testing total raw score of 47.6. On average the Teaching group showed a growth in the Raw Score of the Sutherland Phonological Awareness Test of 25%. The Control Group only showed an average growth of 2.8% in their overall SPAT Raw Score, indicating the Teaching Group had 22% greater growth than the Control Group in the raw score averages.

Student	Syllable Count Pre	Syllable Count Post	Rhymme Detection Pre	Rhymme Detection Post	Rhymme Product Pre	Rhymme Product Post	Blend CVC Pre	Blend CVC Post	Onset ID Pre	Onset ID Post	Final Phoneme ID Pre	Final Phoneme ID Post	Seg CVC Pre	Seg CVC Post	Seg Blends Pre	Seg Blends Post	Deletion Onset Pre	Deletion Onset Post	Deletion Boundary Pre	Deletion Boundary Post	Deletion Internal Pre	Deletion Internal Post	Non word reading Pre	Non word reading Post	Nonword Spelling Pre	Nonword Spelling Post	Total Score Pre	Total Score Post
A	3	4	3	4	4	4	4	4	2	4	4	4	4	4	2	3	4	4	1	1	1	0	1	3	1	4	34	43
B	3	4	4	4	1	4	3	4	3	4	3	4	3	4	1	2	4	4	2	3	3	2	1	5	1	1	32	45
C	1	4	4	4	3	4	4	4	4	4	4	4	4	4	4	4	4	4	0	2	1	4	2	5	3	3	38	41
D	4	4	4	4	3	4	4	4	4	4	4	4	4	4	4	4	4	4	1	4	2	4	2	5	2	4	42	53
E	3	4	4	4	4	4	4	4	2	4	4	4	3	4	1	4	3	4	3	4	3	2	5	7	5	7	44	56
F	2	4	4	4	3	4	3	4	4	4	3	4	4	4	3	4	3	2	1	1	0	2	2	2	0	1	32	40
G	4	3	4	3	4	4	4	4	4	4	4	3	4	4	3	2	4	3	4	4	0	0	5	3	5	2	49	41
H	3	4	4	4	2	4	2	4	3	4	4	4	4	4	0	1	4	4	0	1	0	2	2	0	0	0	28	36
I	2	3	3	4	2	4	4	4	3	4	4	3	4	4	1	1	4	3	0	0	0	0	2	4	2	2	31	32
J	4	2	4	4	3	4	4	3	4	3	4	4	4	4	2	2	4	4	3	3	0	1	2	2	3	1	41	37
Maximum Score	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	8	8	8	8	60	60
Mean Teaching Group	2.8	4	3.8	4	3	4	3.8	4	3	4	3.8	4	3.6	4	2.4	3.4	3.8	4	1.4	2.8	2	2.4	2.2	5	2.4	3.8	38	47.6
Mean Control Group	3	3.2	3.8	3.8	2.8	4	3.4	3.8	3.6	3.8	3.8	3.6	4	4	1.8	2	3.8	3.2	1.6	1.8	0	1	2.6	2.2	2	1.2	36.2	37.2

Table 4

The areas of the SPAT that are of most relevance to the hypothesis indicate that the Teaching Group showed good growth. As Table 4 shows, on average the Teaching Group showed a 33% growth in the average raw score of Onset ID and 25% growth in Segmenting and Blending group average. In comparison the Control Group showed on average a 5.5% growth in Onset ID and 11% growth in Segmenting and Blending. In the area of Non Word Reading the Teacher Group showed an average growth of 127% and the Control Group on average showed no growth in Non Word Reading. Finally it can also be seen in Table 4 that the Teaching Group showed an average improvement of 58% in the Non Word Spelling raw score, increasing from an average raw score of 2.4 to 3.8. The Control Groups raw score average in Non Word Spelling decreased from their pre test results. These results show that in the areas focused on in the SPAT, the Teaching Group showed more growth than the Control Group.

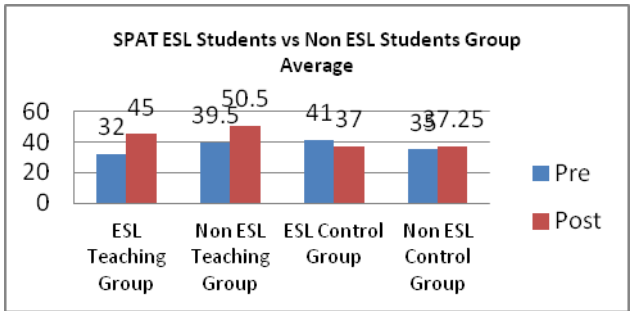
RR students Group Average



Graph 2

From Graph 2 it can be seen that the Reading Recovery students in the Teaching Group improved their average SPAT raw score and showed a growth of 29%. Students in the Teaching Group who have not received Reading Recovery increased their raw score and showed a minimally greater growth of 31%. In the Control Group, the Reading Recovery students showed no growth in their SPAT results and the non Reading Recovery students showed 6% growth.

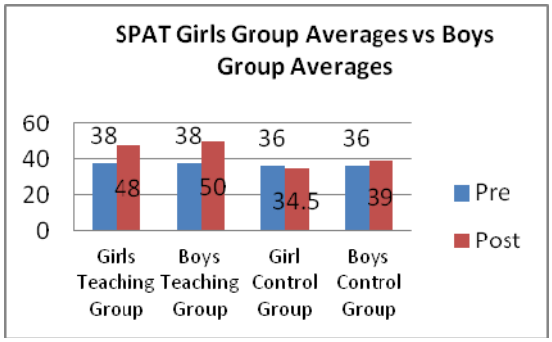
ESL students Group Average



Graph 3

The ESL student, in the Teaching Group showed the most growth of 41% in phonological awareness, as shown in Graph 3. Non ESL student's average raw score in the Teaching Group increased and they showed a growth of 28%. In the Control Group, the ESL student had a lower Post SPAT Raw Score than her Pre SPAT Raw Score. Non ESL students average raw score in the Control Group increased from 35 to 37.25, a growth of 6%.

Boys and Girls Group Averages

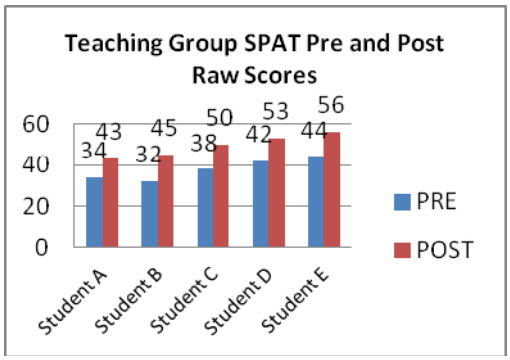


Graph 4

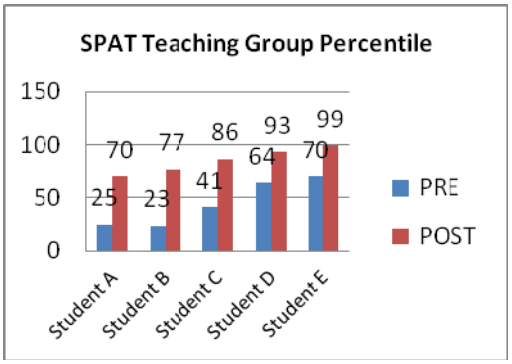
Graph 4 shows that in the Teaching Group, the Girls showed a growth of 26% in their average SPAT Raw Score, their raw score average improving by 10 points. The Boys in the Teaching Group showed a greater growth of 32%, increasing their average raw score by 12 points. In the Control Group, the Girls average SPAT raw score decreased, demonstrating no growth. The boys in the Control Group improved their average raw score by 3 points, an average growth of 8%.

SPAT INDIVIDUAL

Teaching Group Individual Results



Graph 5



Graph 6

In the Teaching Group, all students showed some growth in their SPAT Raw Scores. From Graphs 5 and 6 it can be seen that Student A showed 26% growth, increasing from a raw score of 34 to 43 and improving by 45 percentile points. Student B showed 41% growth, the most in the Teaching Group, increasing from a raw score of 32 to 45 and improving by 54 percentile points. Student C showed by 32% growth, improving from a raw score of 38 to 50 and increasing 45 percentile points. Student D showed 26% growth, increasing their raw score by 11 points and improving 29 percentile points. Finally Student E scored 54 out of a possible 60, improving their raw score by10 points, percentile by 29 points and showed 27% growth.

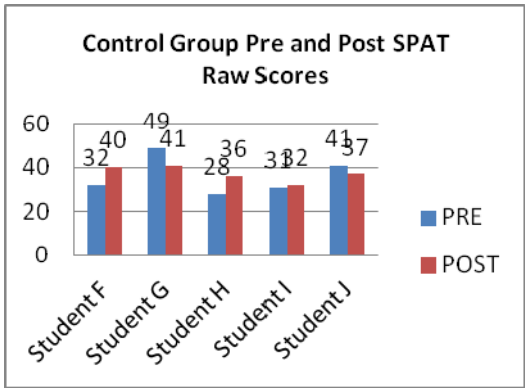
Four out of the five students in the Teaching Group had a post test Percentile rank above the middle half of the distribution for their Year of schooling (Neilson 2003)

From Table 4 it can be seen that all students in the Teaching Group scored 100% correct for Onset ID question. Students A and E showed 100 % growth, doubling their scores and Student B showed a 33% growth. Students C and D maintained the same score. In Segmenting and Blending, Table 4 shows that Students A showed a 50% growth and Student B showed a 100% growth, doubling their score. Students C and D maintained their 100% pre testing result and Student E showed a great growth scoring 100% in Segmenting and blending; a growth of 300%.

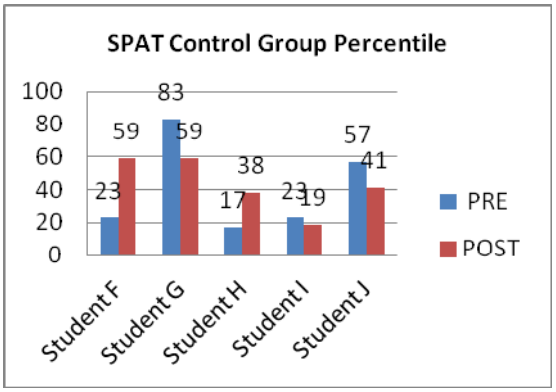
In the Nonword Reading question, from Table 4 it can be seen that 4 out of the 5 students in the Teaching Group scored 5 or more out of a possible 8 points. Student B showed 400% growth, Students C and D showed 150% growth, Students A 200% growth and Student E 40% growth.

From Table 4 it can be seen that the Teaching Group also showed great growth in the Nonword Spelling question. The highest post test score was 7 out of 8 by Student E. Students B and C maintained their scores, while Student D doubled their score; showing 100% improvement and Student E showed 40% improvement. Student A showed the most growth of 300% and scored 4 out of a possible 8.

Control Group Individual Results



Graph 7



Graph 8

In the Control Group from Graph 7 and 8 it can be seen that two out of the five students SPAT Post Testing Raw Scores were less than their pre testing results. Of the remaining students, the highest growth was Student H who showed a growth of 29%, increasing from a raw score of 28 to 36 and improving 21 percentile points.

The Control Group showed mixed results in individual score in the areas focused on in SPAT.

From Table 4 it can be seen that all students in Control Group except Student J got 100% correct for Onset ID in post testing. Student J in pre testing scored 100% correct but in post testing scored 75% correct. In the area of Segmenting and Blending, Table 4 shows that Student F showed a growth of 33% and Student H improved his raw score from 0 to 1. Students I and J maintained the same score and Student G's post testing results were lower than

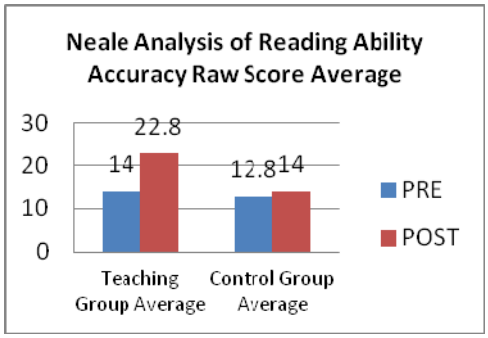
his pre testing in Segmenting and Blending. These results indicate that the Control Group showed less growth in these areas than Teaching Group.

From Table 4 it can also be seen that in the area of Nonword Reading, in the Control Group, Students F, G, H and J showed no improvement in results with G and H having lower post data than their pre. Students F and J maintained the same score and Student I showed 100% growth. Student I had the highest score in this group with 4 out of a possible 8, this score was lower than the highest score in the Teaching Group (see graph 9). Student H had the lowest score of 0; 2 less than his pre testing score. In the Control Group results of Nonword Spelling, Table 4 shows that Student F was the only student in the Control Group that showed any growth with his score increasing from 0 to 1.

Neale results

Group Results

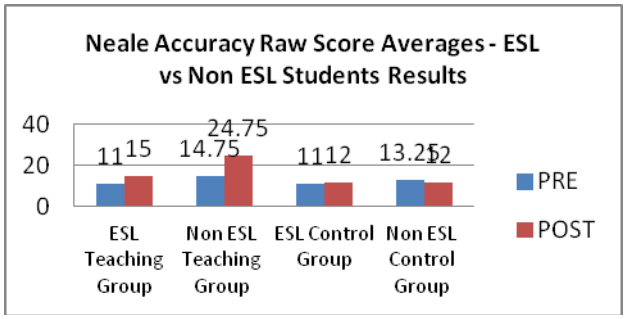
Accuracy



Graph 9

From Graph 9 it can be seen that the Teaching Group showed great growth in reading accuracy of a prose with their average raw score increasing by 8.8 points, a growth of 63%. The Control Group's average also showed growth but not to the same extent as the Teaching Group with their average raw score increasing by 1.2 points, a small growth of 9%.

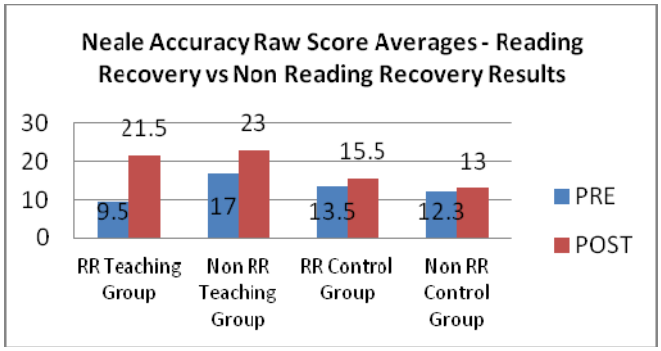
ESL Group Accuracy Averages



Graph 10

From Graph 10 it can be seen that the ESL student in the Teaching Group increased their average accuracy raw score by 4 points, a growth of 36%. The Non ESL students in Teaching Group improved their average raw by 10 points, a growth of 68%. In the Control Group, the ESL student showed an improvement in her raw score by 1 point, a growth of 9%. The Non ESL students in the Control Group decreased their raw score average.

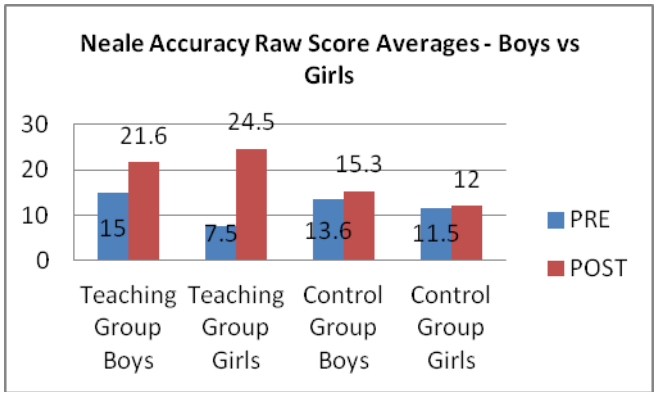
Reading Recover Accuracy Group Averages



Graph 11

From Graph 11 it can be seen that the Reading Recovery students in the Teaching Group increased their average accuracy raw score by 12 points, a growth of 126%, the most overall. The Non Reading Recovery students in Teaching Group improved their average raw score from 17 to 23, a growth of 35%. In the Control Group, the Reading Recovery students showed a smaller improvement in their average raw, a growth of 15%. The Non Reading Recovery students in the Control Group increased their raw score average from12.3 to 13, a growth of 6%.

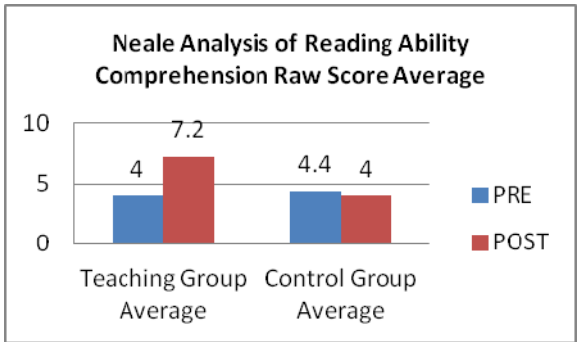
Boys and Girls Group Accuracy Averages



Graph 12

From Graph 12 it can be seen that the Boys in the Teaching Group increased their average accuracy raw score by 6.6 points, a growth of 44%. The Girls in the Teaching Group improved their average raw score from 7.5 to 24.5, a great growth of 227%, the most overall. In the Control Group, the Boys showed a smaller improvement in their average raw score, a growth of 12.5%. The Girls in the Control Group increased their raw score average from11.5 to 12, a growth of only 4%.

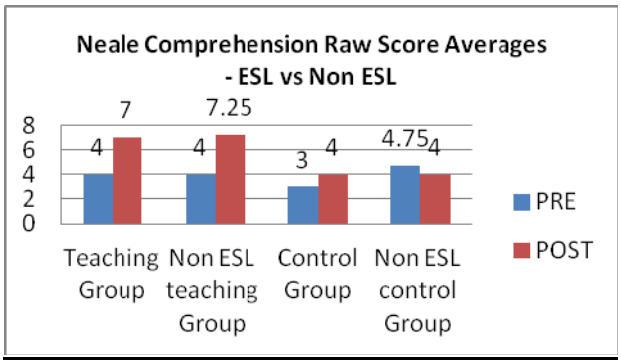
Comprehension



Graph 13

Graph 13 shows that the Teaching group also showed growth in reading comprehension of a prose with their average raw score increasing from 4 to 7.2, a growth of 80%. The Control Groups average reading comprehension score of a prose however declined slightly from a raw score average of 4.4 down to 4.

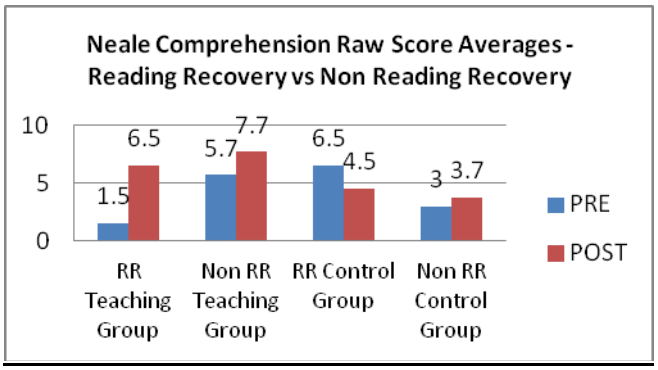
ESL Comprehension Group Averages



Graph 14

From Graph 14 it can be seen that the ESL student in the Teaching Group increased their reading comprehension raw score by 3 points, a growth of 75%. The Non ESL students in Teaching Group improved their average raw score from 4 to 7.25, a growth of 81%, a slightly higher growth. In the Control Group, the ESL student showed a smaller improvement in her raw score from 3 to 4, a growth of 33%. The Non ESL students in the Control Group decreased their raw score average from 4.75 to 4.

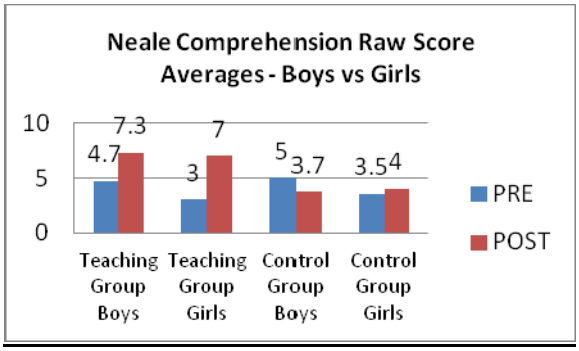
Reading Recovery Comprehension Group Averages



Graph 15

From Graph 15 it can be seen that the Reading Recovery students in the Teaching Group showed the greatest growth, increasing their average comprehension raw score by 5 points, a growth of 333%. The Non Reading Recovery students in Teaching Group improved their average comprehension raw score by 2 points, a growth of 35%. In the Control Group, the Reading Recovery students showed a decrease in their average comprehension raw score. The Non Reading Recovery students in the Control Group increased their comprehension raw score average from3 to 3.7, a growth of 23%.

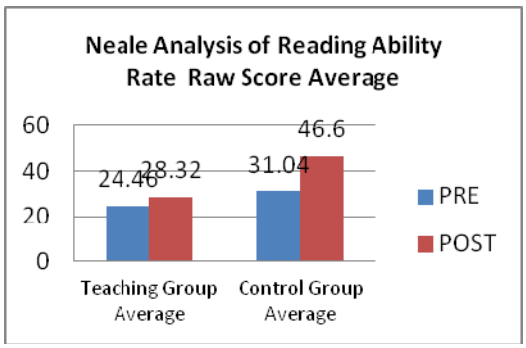
Boys and Girls Comprehension Group Averages



Graph 16

From Graph 16 it can be seen that the Boys in the Teaching Group increased their average comprehension raw score by 3 points, a growth of 64%. The Girls in the Teaching Group improved their average raw score from 3 to 7, a greater growth of 133%. In the Control Group, the Boys showed a decrease in their comprehension average raw score. The Girls in the Control Group increased their raw score average from3.5 to 4, a growth of 14%.

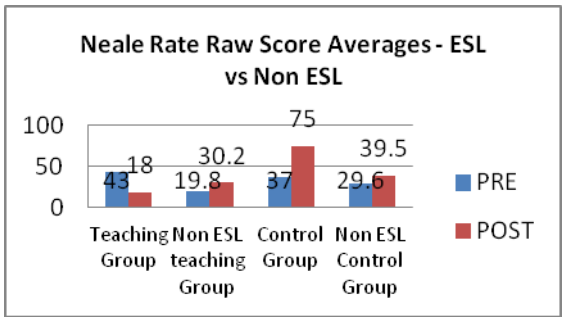
Rate



Graph 17

From Graph 17 it can be seen that The Teaching Groups reading rate at a prose level showed some growth but not to the extent of the Control Groups. The Teaching Groups average reading rate increased slightly from 24.46 words per minute to 28.32 words per minute whereas the Control Groups average reading rate at prose level increased from 31.04 words per minute to 46.6 words per minute.

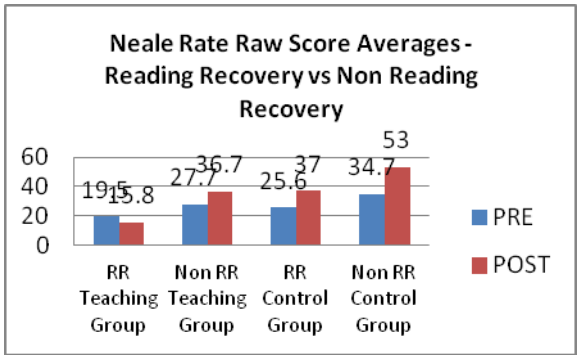
ESL Group Rate Averages



Graph 18

From Graph 18 it can be seen that the ESL student in the Teaching Group decreased their reading rate, reading 25 less words per minute. The Non ESL students in Teaching Group improved their average reading rate by 10.4 more words per minute. In the Control Group, the ESL student showed the greatest improvement in reading rate; reading 40 more words per minute. The Non ESL students in the Control Group increased their reading rate average from 29.6 to 39.5 words a minute.

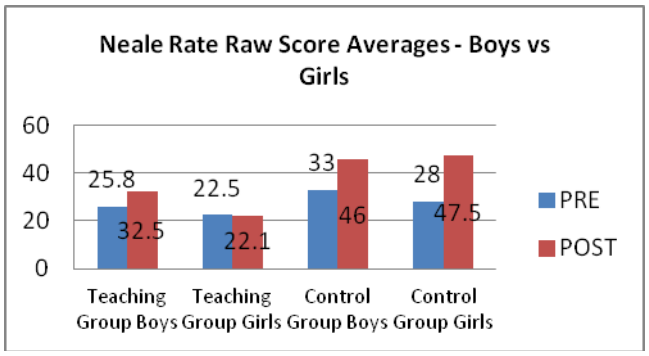
RR Group Rate Averages



Graph 19

From Graph 19 it can be seen that the Reading Recovery students in the Teaching Group decreased their average reading rate by 3.7 words less per minute. The Non Reading Recovery students in Teaching Group improved their average reading rate by 9 more words read per minute. In the Control Group, the Reading Recovery students showed an increase in their average reading rate from 25.6 to 37. The Non Reading Recovery students in the Control Group increased their reading rate average by an average of 18.3 more words per minute.

Boys and Girls Group Rate Averages



Graph 20

From Graph 20 it can be seen that the Boys in the Teaching Group increased their average reading rate by 6.7 words per minute. The Girls in the Teaching Group decreased their average reading slightly from 22.5 to 22.1 words per minute. In the Control Group, the Boys showed an increase in their average reading rate from 33 to 46 words read per minute. The Girls in the Control Group also increased their average reading rate from 28 to 47.5.

Individual results for discussion

ACCURACY

Teaching Group

Student	Raw Score		Percentile		Stanine		Reading Age		Performance Descriptor	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
A	6	23	7	46	2	5	***	7.0	Very Low	Above Average
B	11	15	16	26	3	4	6.1	6.6	Below Average	Average
C	13	20	23	40	4	4	6.2	6.10	Average	Average
D	19	26	33	53	4	5	6.7	7.2	Average	Above Average
E	21	30	37	60	4	6	6.8	7.5	Average	Very High

Table 5: Teaching Group Reading Accuracy Results in Neale

From Table 5 it can be seen that all students in the Teaching Group improved in reading accuracy at the prose level. In the Teaching Group Student A showed the largest growth in reading accuracy of a prose with their raw score increasing 17 points (283% growth). Student A also increased 3 stanines and moved from the percentile rank of 4 to 39. With this result Student A moved from a reading age of less than 6 years of age to a reading age of 7 and a performance descriptor of Very Low to Above Average (Neale 1999, pg 86 and 102). Student E showed the second most growth in reading accuracy. Student E's raw score in reading accuracy at prose level increased by 9 points, increasing 2 stanines and the percentile rank of 37 to 60. With this result Student E improved his reading age by 7 months and attained a post test performance descriptor of Very High. Student B's raw score in accuracy increased by 4 points, moving from a reading accuracy percentile of 16 to 26 and stanine of 3 to 4. Their performance descriptor increased from below average to average performance. Student C and Student D's raw score in accuracy both increased by 7 points. Student C increased from a percentile rank of 23 to 40 but maintained the same stanine. Student D moved one stanine from Stanine 4 to 5 and increased their percentile rank from 33 to 53.

Control Group

Student	Raw Score		Percentile		Stanine		Reading Age		Performance Descriptor	
	Pre	Post					Pre	Post	Pre	Post
F	15	17	27	35	4	4	6.4	6.8	Average	Average
G	12	14	19	20	3	3	6.2	6.5	Below Average	Below Average
H	14	15	25	26	4	4	6.3	6.6	Average	Average
I	12	12	19	16	3	3	6.2	6.4	Below Average	Below Average
J	11	12	16	16	3	3	6.1	6.4	Below Average	Below Average

Table 6: Control Group Reading Accuracy Results in Neale

From Table 6 it can be seen that students in the Control Group also showed some improvement in reading accuracy results but not to the same extent as the Teacher Group. Most students in the Control Group showed minimal growth in the Neale reading accuracy scores. Students F and G both made the most growth in accuracy raw score, increasing by 2 points. Student H and Student J's accuracy raw score improved by 1 point and Student I maintained the same score. All students remained in the same stanine and showed minimal change in their percentile. Students who were below average in performance descriptor remained so in post test data.

COMPREHENSION

Teaching Group

Student	Raw Score		Percentile		Stanine		Reading Age		Performance Descriptor	
	Pre	Post					Pre	Post	Pre	Post
A	0	5	1	31	1	4	***	6.6	***	Average
B	4	7	19	36	3	4	6.2	6.10	Below Average	Average
C	3	8	10	40	2	5	6.0	7.0	Very Low	Above Average
D	6	9	27	47	4	5	6.5	7.2	Average	Above Average
E	7	7	30	36	4	4	6.7	6.10	Average	Average

Table 7: Teaching Group Reading Comprehension Results in Neale

From Table 7 it can be seen that Student A and C in the Teacher Group made the most growth in comprehension raw scores, increasing their pre test scores by 5 points. Student B and D increased their comprehension scores both by 3 points and Student E maintained their scores in comprehension. Student A moved from a reading comprehension

percentile of 0 to 31 and from stanine 1 to 4. Student C moved 3 stanines and increased 30 percentile points. Students B and D moved 1 stanine and 20 percentile points and Student E remained on the same stanine but moved from percentile 30 to 36. All students results were considered average or above in performance descriptor.

Control Group

Student	Raw Score		Percentile		Stanine		Reading Age		Performance Descriptor	
	Pre	Post					Pre	Post	Pre	Post
F	5	6	24	34	4	4	6.3	6.8	Average	Average
G	8	3	34	11	4	3	6.9	6.2	Average	Average
H	2	3	4	11	1	3	***	6.2	Very Low	Average
I	4	4	19	23	3	3	6.2	6.4	Below Average	Average
J	3	4	10	23	2	3	6.0	6.4	Very Low	Average

Table 8: Control Group Reading Comprehension Results in Neale

From Table 8 it can be seen that most students in the Control Group showed some improvement in reading comprehension raw score results. Student F, Student H and Student J all made the most growth in score, increasing by 1 point. Student I maintained the same score but Student G fell 5 points from their pretesting results in comprehension of a prose. Student H moved up 2 stanines and increased from percentile 4 to 11. Students J moved up 1 stanine and increased 13 percentile points. Student F and Student I remained in the same stanine, with Student F increasing 10 Percentile points and Student I moving up 4 percentile points. Student G moved down 1 stanine from 4 to 3 and decreased 23 percentile points.

RATE

Teaching Group

	Reading Rate		Difference	Reading Age		Performance Descriptor	
	Pre	Post		Pre	Post	Pre	Post
Student A	24 words per minute	17.2 words per minute	Read 6.8 less words per minute	6.3	6.2	Average	Average
Student B	43 words per minute	18 words per minute	Read 25 less words per minute	7.5	6.3	Average	Average
Student C	15 words per minute	14.4 words per minute	Read approximately the same amount of words per minute	***	***	Below Average	Very Low
Student D	21 words per minute	27 words per minute	Read 6 more word per minute	6.1	6.8	Average	Average
Student E	19.3 words per minute	65 words per minute	Read 45.7 more words per minute	6.0	9.3	Below Average	Very High

Table 9: Teaching Group Reading Rate Results in Neale

From Table 9 it can be seen that Student E showed a very good growth in his reading rate raw score at a prose level. His raw score increased by 45.7 words per minute more, from 19.3 words read per minute to 65, indicating that he read at a rate of more than 1 word a second. Student D also improved her reading rate by 6 words a minute. Student A, Student B and Student C all showed a decrease in their reading rate at prose level in post raw score data. All students except Student C's post test performance descriptors were described as average or above.

Control Group

	Reading Rate		Difference	Reading Age		Performance Descriptor	
	Pre	Post		Pre	Post	Pre	Post
Student F	36 words per minute	32 words per minute	4 words less per minute	6.3	6.2	Average	Average
Student G	15.2 words per minute	42 words per minute	Read 26.8 more words per minute	7.5	6.3	Average	Average
Student H	48 words per minute	64 words per minute	Read 16 more words per minute	***	***	Below Average	Very Low
Student I	19 words per minute	20 words per minute	Read 1 more word per minute	6.1	6.8	Average	Average
Student J	37 words per minute	75 words per minute	Read 38 more words per minute	6.0	9.3	Below Average	Very High

Table 10: Control Group Reading Rate Results in Neale

From Table10 can see that four out of the five students in the Control Group increased their reading rate at prose level. Student J increasing their rate the most with them approximately doubling the amount of words they can read in a minute. Student F was the only student in the Control Group to read fewer words per minute in his post testing.

Rime Units Test

Student	3 Letter Pre Raw Score	3 Letter % Pre	3 Letter Post Raw Score	3 Letter % Post	4 Letter Pre Raw Score	4 Letter % Pre	4 Letter Post Raw Score	4 Letter % Post	5 Letter Pre Raw Score	5 Letter % Pre	5 Letter Post Raw Score	5 Letter % Post	Total Score Pre	Total % Pre	Total Score Post	Total % Post
A	15	63%	21	87.50%	29	39%	60	81%	20	41%	33	67%	64	44%	114	78%
B	14	58%	23	96%	31	42%	58	74%	8	16%	40	82%	53	36%	121	82%
C	17	71%	24	100%	35	47%	68	92%	13	27%	40	82%	65	44%	132	90%
D	23	96%	24	100%	57	77%	63	85%	34	69%	41	84%	114	78%	128	87%
E	23	96%	24	100%	62	84%	72	97%	29	59%	48	98%	114	78%	144	98%
F	15	63%	20	83%	30	41%	31	42%	8	16%	4	8%	51	35%	55	37%
G	13	54%	19	79%	38	51%	44	59%	17	35%	23	47%	68	46%	87	59%
H	14	58%	16	67%	20	27%	26	35%	8	16%	9	18%	42	29%	50	34%
I	17	71%	18	75%	11	15%	24	32%	0	0%	7	14%	28	19%	49	33%
J	18	75%	18	75%	30	41%	28	38%	13	27%	13	27%	61	41%	58	39%
Total	24	100%	24	100%	74	100%	74	100%	49	100%	49	100%	147	100%	147	100%
Average Score (Mean)Teaching Group	18.4	77%	23	96.7%	42.8	58%	64.2	86%	20.8	42%	40.4	83%	82	56%	127.8	87%
Average Score (Mean)Control Group	15.4	64%	18	76%	25.8	35%	30.6	41%	9.2	19%	11.2	23%	50	34%	59.8	40%

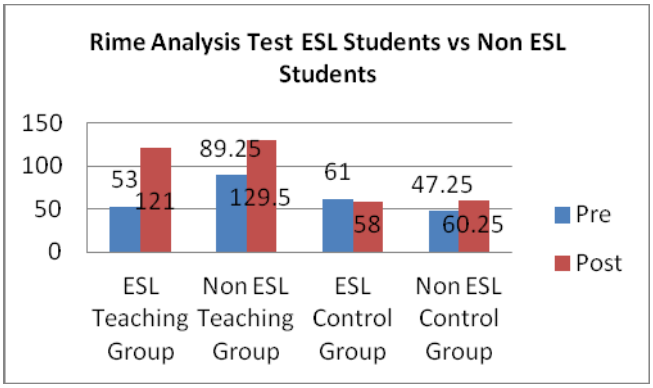
Table 11: Rime Units Test Results

Group

From Table 11 it can be seen that the Teaching Group had higher pre raw score averages than the Control Group in three, four and five letter words and therefore a higher total pre raw score average of 82 compared to the Control Groups total average pre raw score of 50. Post test data shows that Teaching group also showed the highest post test raw scores and most growth. Teaching Group had an average total post test raw score of 127.8, an increase of 45.8 points compared to the control group who had an average total post test raw score of 59.8, an increase of only 9.8 points. Teaching Group therefore showed an average growth of 56% compared to The Control Group which showed a average growth of 20% in the overall results.

In all areas (3, 4 and 5 letter words) the Teaching Group showed the most growth in the average raw score. In 3 Letter rime words the Teaching group showed 8% more growth than the Control Group, in 4 letter rime words the Teaching Group showed 24% more growth and in 5 letter rime words the Teaching Group showed 72% more growth than the Control Group.

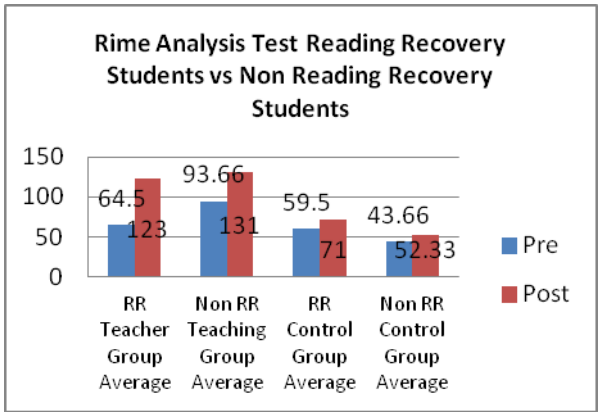
ESL Group Analysis



Graph 21

From Graph 21 can see that the ESL student in the Teaching Group showed the biggest improvement. In his Rime Analysis Test raw score he showed an improvement of 68 points, a growth of 128%. Non ESL students in the Teaching Group also showed an increase in their average raw score from 89.25 to 129.5, a growth of 45%. In the Control Group, the ESL student showed a decrease in their raw score and Non ESL Control Group average raw score increased by 13 points, a growth of 28%

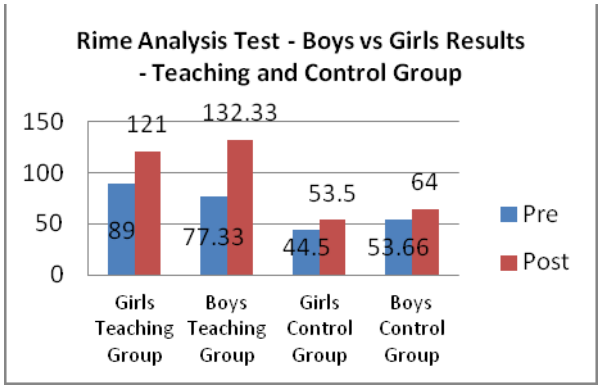
Reading Recovery Analysis



Graph 22

From Graph 22 it can be seen that the Reading Recovery students in the Teaching Group showed great growth, reading on average 58.5 more words post test, a growth of 91%. Non Reading Recovery students in the Teaching Group showed a growth of 40%. In the Control Group, Reading Recovery and Non Reading Recovery students showed the same amount of growth of 19%.

Boys and Girls Group Rate Averages



Graph 23

From Graph 23 it can be seen that the girls in the Teaching Group had a smaller growth than the boys in their average raw scores. The girls were able to read 32 more words, a growth of 36% and the boys were able to read 55 more words and showed a growth of 71% (almost double the girls' growth). In the Control Group the boys and girls showed similar growths, with the girls reading 9 more words and displaying 20% growth compared to the boys who read 10.3 more words and showed a growth of 19%.

Individual Results

Teaching Group

From Table 11 it can be seen that each individual student in the Teaching Group showed growth. Student B and Student C showed great growth doubling their overall raw score. Student A's total raw score increased by 50 words and showed a great growth of 78%. Student B showed the most improvement in total raw score in the Teaching Group. His raw score increased by 68, a growth of 128%. Student C also showed great growth in the Teaching Group with his raw score increasing by 67 words, a growth of 103%. Student D's total raw score improved by 14 words, a growth of 12% and Student E's raw score increased by 30 words, a increase of 26 %. Student E didn't show the most growth but was able to read 144 words out of the possible 147.

From Table 11 it can be seen that individuals in the Teaching Group showed great post test results in 3 letter words with Students C, D and E accurately reading 100% of the words post test. Student B showed the most growth reading 7 more words and showing an improvement of 64%.

In 4 Letter words Student E was able to read 97% of the words, Student C 92% of the words and Student D 85%. Student C almost doubled the amount of 4 letter words they read post test, increasing by 33 words from 35 to 68.

In 5 letter words all students in the Teaching Group showed growth. Student B showed the most growth in reading 5 letter rimes. Pre test Student A was able to read 8 words and post testing he was able to read 40 words, four times the amount of words (32 more words) and a growth of 400%. Student C read 27 more words post test and showed a growth of 207%. Student A and E showed similar growths of 65% and 66% respectively. Student D showed the least amount of growth, 21%.

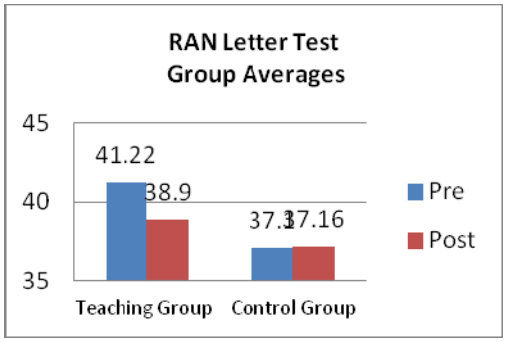
Control Group

From Table 11 it can be seen that four out of the 5 students in Control Group improved in their overall raw score but showed less growth than the Teaching Group. Student I showed the most growth, with her raw score increasing by 21 words, a growth of 75%. Student G showed the second highest improvement in the Control Group, reading 19 more words, a growth of 28%. Student F and Student H showed slight improvements. Student F showed a growth of 8% and Student H a growth of 19%. Student J showed a slight decrease in their raw score, reading 3 less words in their post test.

From Table 11 it can be seen that no students in the Control Group scored 100% in post testing 3 letter rime words. Student G showed the most growth reading 6 more words, showing a growth of 46%. Student F showed a growth of 33%, Student H 14% growth and Student I 6% growth. Student J showed no growth in 3 letter rime words, maintaining his score of 18 out of 24. In 4 letter word rimes, 4 out of the 5 students in the Control Group showed growth and only one student read more than 50% of the words correctly. In 5 letter word rimes the Control Group showed minimal growth with 2 students showing no growth.

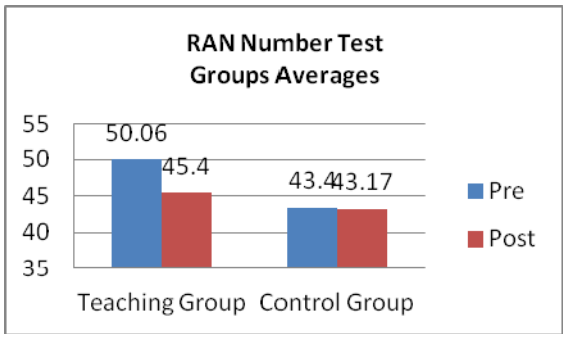
Rapid Naming Ability Test Results

Group



Graph 24

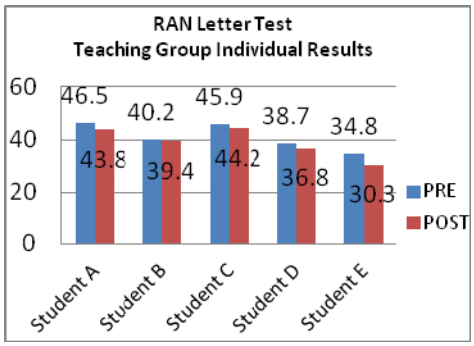
From Graph 24 it can be seen that the Teaching Group had a higher Rapid Naming Ability Letter Test pre test average, indicating that the Teaching Group took 4.12 seconds longer to read the letters than the Control Group in pre testing. In post testing the Teaching Group still took longer to read the letters than the Control Group but the Teaching Group showed a greater improvement, taking an average 2.32 seconds less to read the letters in post testing. The Control Group showed no improvement in post test, taking an average 0.06 seconds longer to read the letters.



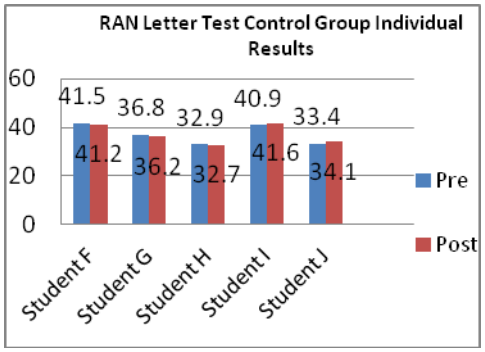
Graph 25

The Teaching Group again in pre testing took longer to read the words than the Control Group, as seen in Graph 25. The Teaching Group again showed more growth in RAN of numbers with the Teaching Group decreasing their reading rate of numbers by an average of 4.66 seconds. The Control Group showed minimal improvement with them taking an average 0.23 seconds less to read the numbers.

Individual Results

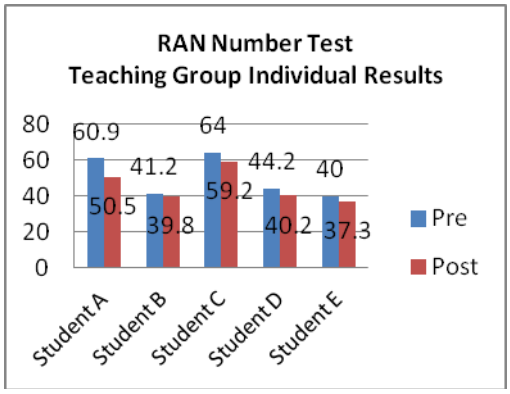


Graph 26

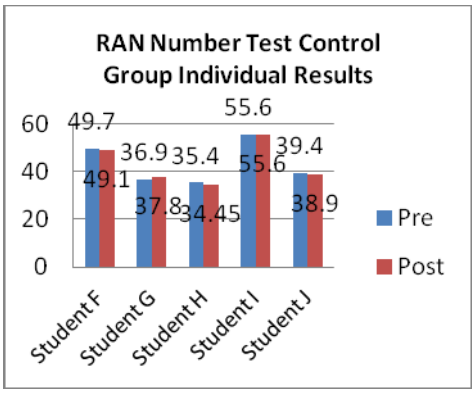


Graph 27

In the Teaching Group all students showed some improvement in their average reading times of letters, as see in Graph 26. Student E showed the most growth, decreasing their time to automatically name letters by 4.5 seconds. In contrast Graph 27 shows that the best improvement from the Control Group was Student G who only decreased their naming time by 0.6 seconds. Two students in the Control Group increased their naming time by a minimal amount.



Graph 28



Graph 29

All students in the Teaching Group showed some improvement in naming numbers, as seen in Graph 28. Student A showed the most growth decreasing their time by 10.4 seconds. The Control Group however showed minimal growth with most students showing no or less than 1 second growth in naming numbers as seen in Graph 29.

Discussion

This study aimed to link the effectiveness of explicitly teaching segmenting and blending skills of onset and rime to assist students in reading words in isolation and in a prose. The results support the hypothesis being tested as the data shows an overall improvement and growth in student performance in word and prose reading. The hypothesis was further supported with the Teaching Group showing greater growth than that of the Control Group in all areas except rate at prose level. Comparison of results prior to the intervention program with post – test results indicate that the Teaching Group students group average in accuracy in Rime word reading task improved by 56%, overall phonological awareness improved by 25%, reading of non words in the Sutherland Phonological Awareness Test improved by 127% and at prose level, reading accuracy improved by 63%. This in turn compared to Control Groups results in Rime word reading task, phonological awareness, non word reading task and reading accuracy at prose level showed that the Teaching Group showed greater growth than the Control Group. The Teaching Group showed 36% more growth in Rime word reading task, 22% more growth in overall phonological awareness, 127% more growth in non word reading and 54% more growth at prose level compared to the Control Group. Pre – tests show limited application of segmenting and blending skills to read words at isolated word and prose level. Students were observed using inefficient and ineffective strategies such as using distinguishing visual features or simply guessing to read words. Post test observations and results support that the students were using effectively segmenting and blending to decode words more accurately at isolated word and prose level.

The Sutherland Phonological Awareness Test results in this study have supported what many researchers over the past 20 years have shown (Ball & Blachman, 1992; Cunningham, 1990; Fox & Routh, 1984; Davidson & Jenkins, 1994; O'Connor et al., 1996; Torgesen et al., 1992 cited in Oudeans, 2003) that with improved phonological awareness students reading accuracy and decoding skills improve. Through using the SPAT pre test to identify the biggest area of concern for students - segmenting and blending and explicitly teaching this strategy the Teaching Group showed improved reading accuracy of isolated words and at prose level as evident in Neale and Rime Units Test. Through explicitly teaching segmenting and blending, phonological awareness results demonstrate that the Teaching Group students showed a growth of 25% in their overall group average compared to the Control Group who only showed a growth in their average of 2.8%. Within the SPAT the Teaching Group as a whole showed a growth of 25% in their

segmenting and blending average, with Student B doubling their score and Student E showing 300% growth. This as well as anecdotal notes support that the students are using this strategy of segmenting and blending to decode words and as a result have improved in reading accuracy.

SPAT results also show a correlation between improvement in the score of segmenting and blending and non word reading and non word spelling. Students were observed using the segmenting and blending strategy to read and spell the non words. This was practised in the intervention sessions with the students choosing one word from the rime unit and spelling it and writing it in a sentence, sounding it out through segmenting and then blending it together. Teaching Group showed a growth of 127% in their average group score in Non Word Reading and 58% growth in their group average score in non word spelling. The Control Group showed no growth in either of these areas.

Explicitly teaching segmenting and blending of rime words also leads to improvement in decoding rime words in isolation. The Teaching Group showed a group average growth of 56% compared to the Control Group who only showed a group average growth of 20% in the Rime Unit Test. The results showed that the biggest areas of growth for the Teaching Group were four and five letter rime words, with the Teaching Group showing an average growth of 50% in 4 letter word results and their 5 letter results almost doubling with a growth of 94%. This result could be attributed to the intervention structure, with each session focussing on one or two rime units that were chosen as the most difficult for the group in pretesting results analysis as suggested by current research (Johnston, 1999). It was also found that the students who showed the greatest growths in the Teaching Group were the students who were highlighted at most risk in reading due to their pre test scores and other factors such as ESL and receiving Reading Recovery. This supports the research that Phonological awareness skills are teachable (Adams, 1990; Ball & Blachman, 1988, 1991; Brady, Fowler, Stone, & Winbury, 1994; Cunningham, 1990; O'Connor et al., 1995; National Reading Panel, 2000; Smith et al., 1998, cited in Oudeans, 2003) and that instruction often results in significant gains in phonological awareness skills for most children and subsequently improved reading accuracy (Ball & Blackman, 1992; Cunningham, 1990; Fox & Routh, 1984; Davidson & Jenkins, 1994; O'Connor et. al., 1996; Torgesen et al., 1992, cited in Oudean, 2003).

Explicitly teaching the strategy of segmenting and blending increases students at risks in Year One's reading accuracy at the prose level. This was supported by the Neale Analysis of Reading Ability test results which showed that the Teaching Group showed a growth of 63% in their reading accuracy group average at prose level. This is compared to the Control Group which only showed 9% growth in their group average in reading accuracy of a prose. Within the Teaching Group, individuals showed significant growth in their reading accuracy such as Student A who showed a growth of 283% in their reading accuracy, improving 3 stanines and putting them within the average norms for their years of schooling. Each teaching session focussed strongly on segmenting and blending a rime unit phonologically and orthographically and then applying this strategy to read these words practised within a prose. This teaching of a rime unit within context helped students apply their learning to a different situation. Reviewing the words in sessions 5 and 10 also assisted students in applying this strategy. This increase in reading accuracy also leads to improved comprehension with the Teaching Group showing a growth in their group average in reading comprehension of 80%. In contrast the Control Group having showed minimal growth in reading accuracy, subsequently showed no growth in reading comprehension.

Explicit teaching of segmenting and blending leads to increased rate and post intervention Neale Reading Rate results in this current research support this but not to a strong extent. The Teaching Group showed 16% growth in their group reading rate average but the Control Group showed greater growth, with 50% growth in their group reading rate average. Weakness in these results could be attributed to the test tool used. The Neale Reading Analysis Test (1999) is considered by some researchers as being a blunt testing tool and therefore may not have represented the true result. This is further supported by the fact that the Teaching Group read the level 2 text and had a higher accuracy score but as the text was more difficult they read at a slower rate. No students in the Control Group read

the level 2 text. The results and observations however do support the fact that the students were using segmenting and blending strategy effectively to read words at a prose level but not automatically. Activities within the sessions were included to teach and practise RAN such as snap and reading words on flash cards at a fast rate but further teaching would need to be put in place to build students RAN.

Interestingly in the Rapid Naming Alibility Test the Teaching Group showed greater improvement than the Control Group in the time taken to name both letters and numbers. Although the Control Group had a faster reading rate in the Rapid Naming Test pre and post test, they didn't show the most growth. This result further questions the strength and validity of the Neale Rate results. It is suggested that further testing and a different measuring tool used to see if the Teaching Group and Control Groups reading rate growths are accurate and whether teaching of segmenting and blending impacts reading rate results.

Torgesen, Wagner and Rashotte (1994, cited in Crim et. al., 2008) from their research concluded that providing early intervention for students with weak phonological processing skills leads to improved reading accuracy and rate of text and can bring students results up to the normal range. This current research study partly supports Torgesen, Wagner and Rashotte's (1994) statement with two students within the Teaching Group whose Neale Reading Analysis pre tests were below average and very low in reading accuracy showing Average and Above Average scores in their post tests. Two students in the Teaching Group who had below average reading rate scores in Neale pre test however had mixed post test results, with one student improving their results to Very High and the other remaining below average for their years of schooling (see Table 9). It could be concluded that that further long – term intervention should result in more improvement and students performing within the normal ranges for their schooling years.

Three possible variables; ESL, earlier intervention and gender were also analysed to see if they have any impact on the hypothesis; that segmenting and blending improves reading accuracy of isolated words and prose. Results suggest that ESL students could benefit the most from explicit teaching of phonological awareness as the ESL student in the Teaching Group showed the greatest growth of 41% in his overall SPAT raw score results. This could be attributed to ESL students generally having later exposure to or limited pre literate reading experience and the phonological intervention increasing his results. Research on a larger amount of ESL students would need to be conducted to strengthen this theory.

Interestingly the Reading Recovery Students showed the most growth in reading accuracy and comprehension in the Neale Reading Ability Test. In both the Teaching Group and the Control Group the Reading Recovery Students showed the most amount of growth in accuracy in each group suggesting that their earlier invention could have impacted their results. The Reading Recovery students in the Teaching Group however showed a much greater growth than that of the students in the Control Group. This could support the theory that Reading Recovery improves reading accuracy but more explicit teaching of segmenting and blending within the Reading Recovery program or alongside could further improve students at risks reading accuracy. *The structure of this intervention program was similar to a reading recovery session. Students manipulated words, wrote words and put them into a sentence and read a prose practising the skills they had learnt in the session. The sessions however had more flexibility and oral language that may be beneficial in the reading recovery program.* In reading comprehension results the Reading Recovery students in the Teaching Group showed much greater growth, 333% than Non Reading Recovery students. This was not the case in the Control Group with their results decreasing in post testing. This data suggests that explicit teaching of segmenting and blending benefits the most at risk students in Year 1 and that the Reading Recovery Program may benefit from more explicit teaching of this to improve reading comprehension results. This statement however would need further research on a larger amount of students and in various schools, as factors such as reading recovery teacher experience and teaching techniques would need to be explored.

The variable of gender had an impact on results in the areas of reading accuracy and comprehension with girls showing a growth of 227% in the Teaching Group compared to boys who showed 44% growth in reading accuracy.

This growth difference was not supported in the Control Group with Boys showing marginally more growth than girls in reading accuracy. In the case of reading accuracy explicit teaching of segmenting and blending benefited the girls the most but the biggest variable was the teaching not the gender as both gender groups showed good growth. This is the same case in Reading Comprehension results were girls showed greater growth than boys in both the Teaching Group and Control Group. Further research with a larger teaching and control group could indicate if there is a link between improved reading accuracy and comprehension and gender.

All students attended 100% of the lessons and the conditions were the same for all students so these are not possible reasons for differences within the groups results. The size of the group, 5 students could equate to why some students in the Teaching Group didn't show as great results as others. It would be of interest to see the result on 1-1 intervention.

A vital part of the teaching intervention was using the 'Model of Teaching and Learning' developed by Collins, Brown and Newman (1989) (as cited in Munro, 2011) to structure the sessions and to ask students to reflect on the learning which took place during a lesson and discuss when and how the learning could be applied in other situations. It was essential for the students to not only learn the skill but also to be able to transfer this knowledge to other situations. Evidence of this transfer of knowledge was shown when the students independently applied segmenting and blending skills to read unknown words at the prose level in the post test. It is hoped that metacognitive thinking strategies have been improved and embedded as a result of the teaching intervention. It was observed in early teaching sessions that the students required much scaffolding and teacher modelling to successfully attempt and complete tasks. This gradually changed as the students gained knowledge of skills and after about 5 teaching sessions it was observed and recorded using anecdotal notes that the students required less teacher modelling and scaffolding and the students were applying the strategy and skills independently with minimal assistance and mainly receiving feedback only.

Current theory and research supports the importance of teaching phonological awareness skills and particularly phonemic awareness to students who are at risk in reading. Results from this current study demonstrated the effectiveness of explicitly teaching segmenting and blending skills to students in Year 1 using both spoken (phonological) and written words (orthographic) and then applying these in sentence and prose level. An increase in accuracy when reading isolated words and prose was shown by comparing pre and post test results therefore giving evidence to the value of teaching phonological awareness skills.

While the invention program used a structure (Model of Teaching and Learning, Collins et. al., 1989) in which the students articulated the strategies they were using and promoted more self – talk which was observed in the post – testing, this was not formally assessed. It would be useful in further research to measure the changes in self talk and efficacy. Further research could also be done in linking the gains made through explicit phonological instruction with spelling as nonword spelling was briefly analysed but not formally assessed and linked in the hypothesis of this study.

References

Articles:

Chard, D., and Dickson, S. (1999) Phonological awareness: Instructional and assessment guidelines. *Intervention in Schools and Clinics*, 34 (5), 261 – 270.

Chard, D., J & Osborn, J. (1999). Phonics and word recognition instruction in early reading programs: Guidelines for accessibility. *Learning Disabilities Research & Practice*, 14 (2), 107 – 117.

Crim, C., Hawkins, J., Thorton, J., Boon Rosof, H., Copley, J., and Thomas, E. (2008). Early Childhood Educator's Knowledge of Early Literacy Development. *Issues in Teacher Education*, Spring 17 (1), 17 – 30.

Cunningham, J. W., Erickson, K. A., Spadorcia, S. A., Koppenhaver, D. A., Cunningham P., Yoder, D., & McKenna, M. (1999). Assessing decoding from an onset – rime perspective, *Journal of Literacy Research*, 3 (4), 391 – 414.

Felton, R. (1993). Effects of instruction on the decoding skills of children with phonological – processing problems. *Journal of Learning Disabilities*, 26, (9), 583 – 589.

Gaskins, I., Ehri, L.C., Cress, C., O'Hara, c., & Donnelly, K. (1996). Procedures for word learning. Making discoveries about words, *The Reading Teacher*, 50 (4), 312 – 327

Hempenstall, K., (2002). Phonological processing and phonics: Towards an understanding of their relationship to each other and to reading development, *Australian Journal of Learning Disabilities*, 7 (1), 4 – 28.

Johnston, F. (1999). The timing and teaching of word families. *The Reading Teacher*, 53, 64 – 75.

Lane, H., Pullen, M., Eisele, M., and Jordan, L.(2002). Preventing reading failure: Phonological awareness assessment and instruction. *Preventing School Failure*, Spring, 26,(3), 101 - 110.

Liberman, I. Y., Shankweiler, D., & Liberman, A., (1989). The alphabetic principal and learning to read. In Shankweiler, D., & Liberman., I (1989) Phonology and reading disability: Solving the reading puzzle. *Ann Arbor*: University of Michigan Press, 1 - 33.

Oudeans, M. (2003). Integration of Letter – Sound Correspondence and Phonological Awareness Skills of Blending and Segmenting: A Pilot Study Examining the Effects of Instructional Sequence of Word Reading For Kindergarten Children with Low Phonological Awareness. *Learning Disability Quarterly*, 258 – 280.

Pullen, P., Lane, H, Lloyd, J and Nowak, R. (2005) Effects of Explicit Instruction on Decoding of Struggling First Grade Students: A Data – Based Case Study. *Education and Treatment of Children*, 28 (1), 63 – 76.

Vellutino, F. R. & Scanlon, D. M. (1987) *Linguistic coding and reading ability*, In S. Rosenberg (Ed.) Advances in applied psycholinguistics, New York: Cambridge University Press, 1 – 69

Books/Lecture Notes:

Munro, J., (1998). *Assessing and teaching phonological knowledge*. Melbourne: The Australian Council for Educational Research.

Munro, J. K. (2011). Literacy Intervention Strategies. EDU 90247. *Project in Literacy Intervention,* Lecture notes. 2011 Melbourne: The University of Melbourne.

Testing Material:

Neilson, R. (2003) Sutherland Phonological Awareness Test – Revised. **Australia: Dr. Roslyn Neilson.**

Neale, M. D. (1999) Neale Analysis of Reading Ability, 3rd Edition. Melbourne: The Australian Council for Educational Research.

Dalheim, B (2004) Rime Units Test.
http://online.edfac.unimelb.edu.au/LiteracyResearch/pub/tests/37_RIME_TEST2006.pdf

Munroe, J. (Date unknown). Rapid Naming Ability Test – Letters and Numbers.
http://online.edfac.unimelb.edu.au/LiteracyResearch/pub/tests/RAN.htm

Appendix 1: Full Table of Student Data

Name	Control = 0 Teaching=1	Age in MONTHS	Gender 0=Male 1= Female	Years of Schooling	ESL No=0 Yes=1	2=Asp	Earlier Intevention No=0 RR=1	Word Test March	EMA No=0 Yes=1	Attendance No. of sessions	SPAT PRE RAW	SPAT POST RAW	SPAT PRE PERCIENTLE	SPAT POST PERCENTILE	RIME PRE RAW	RIME POST RAW	RIME PRE %	RIME POST %	NEALE PRE Accuracy Raw	NEALE POST Accuracy Raw	NEALE PRE Accuracy Percentile	NEALE POST Accuracy Percentile	NEALE PRE Accuracy Stanine	NEALE POST Accuracy Stanine	NEALE PRE Comprenension Raw	NEALE POST Comprenension Raw	NEALE PRE Comprehension Percentile	NEALE POST Comprehension Percentile	NEALE PRE Comprehension Stanine	NEALE POST Comprehension Stanine	NEALE PRE Rate Raw	NEALE POST Rate Raw	NEALE PRE Rate Percentile	NEALE POST Rate Percentile	NEALE PRE Rate Stanine	NEALE POST Rate Stanine	RAN Letter PRE	RAN Letter POST	RAN Number Pre	RAN Number Post
A	1	7	1	2	0	0	1	1	0	10	34	43	25	70	64	114	44	78	6	23	7	46	2	5	0	5	1	31	1	4	24	17.2	28	12	4	3	46.5	43.8	60.9	50.5
B	1	7.4	0	2	1	0	0	11	0	10	32	45	23	77	53	121	36	82	11	15	16	26	3	4	4	7	19	36	3	4	43	18	56	15	5	3	40.2	39.4	41.2	39.8
C	1	7.4	0	2	0	0	1	12	0	10	38	50	41	86	65	132	44	90	13	20	23	40	4	4	3	8	10	40	2	5	15	14.4	12	7	3	2	45.9	44.2	64	59.2
D	1	7.1	1	2	0	0	0	12	0	10	42	53	64	93	114	128	78	87	19	26	33	53	4	5	6	9	27	47	4	5	21	27	24	33	4	4	38.7	36.8	44.2	40.2
E	1	6.5	0	2	0	0	0	10	0	10	44	56	70	99	114	144	78	98	21	30	37	60	4	6	7	7	30	36	4	4	19.3	65	21	90	3	8	34.8	30.3	40	37.3
F	0	6.6	0	2	0	0	1	5	0	0	32	40	23	59	51	55	35	37	15	17	27	35	4	4	5	6	24	34	4	4	36	32	46	41	5	5	41.5	41.2	49.7	49.1
G	0	7	0	2	0	0	1	10	0	0	49	41	83	59	68	87	46	59	12	14	19	20	3	3	8	3	34	11	4	3	15.2	42	12	60	3	6	36.8	36.2	36.9	37.8
H	0	7	0	2	0	0	0	12	0	0	28	36	17	38	42	50	29	34	14	15	27	26	4	4	2	3	10	11	2	3	48	64	64	89	6	7	32.9	32.7	35.4	34.45
I	0	6.11	1	2	0	0	0	10	0	0	31	32	23	19	28	49	19	33	12	12	19	16	3	3	4	4	19	23	3	3	19	20	21	19	3	3	40.9	41.6	55.6	55.6
J	0	6.10	1	2	1	0	0	6	0	0	41	37	57	41	61	58	41	39	11	12	16	16	3	3	3	4	10	23	2	3	37	75	48	92	5	8	33.4	34.1	39.4	38.9

Appendix 2: Example of lesson plan

Action Research Project Lesson Plan

Lesson 1

Rime Unit: aw

Words: raw, saw, jaw, paw, thaw, draw, claw.

Text:

Activity	Teacher	Student
Phonological Activity 2mins	Show images of words with rime unit 'aw'. What do all these words have in common/share?	Students say aloud (taking turns) what the words are. Students recognise that they all end in same rime unit 'aw'
Introduce Rime Unit Phonological Activity – rhyming 3 mins	Today we are going to focus on words that all share the same rime unit/ending – aw. Model the sound and prompt students to say it aloud. If I say raw, jaw, can you think of any other words that rhyme with it? Real or nonsense word (take note of students responses – types of words they say)	Students practice saying aloud 'aw' sound. Go round in a circle and verbally express words that rhyme
Orthographic and Phonological Activity 5 mins	Words presented on flash cards or word slide to students with onset and rime split and in different colours. Explicitly model first word – if I put the beginning and ending sounds together I can read this word. The first chunk says... The ending is.. If I put it together (blend) the word is... Point to each letter cluster and rime as I say it. Now let's all have a go	As a whole group read onset and rime together and then blend. Then take in turns placing onset and rime together and saying words. Point to each letter cluster and rime as they say it.
Practice making 'aw' words individually 5 mins	Teacher gives student own set of words on flash cards, using rime and magnetic letters or IWB with onset and rime split and in different colours.	They practice putting sounds together and making words, saying the separate onset and rime and then blending together aloud.
Apply rime and practice in a game or activity (Target RAN) 5 mins	Teacher explains rules of game or activity used to reinforce taught rime unit.	Students play game, practice saying rime unit words and talk through their strategies
Choose one word and write it 2 mins	Teacher asks students to choose one word with rime unit we have practicing and write it on flash card.	Students write word chose on flash card and says it aloud, pointing to onset and rime as they say it
Say the word in a sentence 2 mins	Teacher explicitly models using a rime unit word in a sentence. Invites students to think of a sentence for their word they	Students say a sentence with their chosen rime init word in it

	chose and wrote down	
Write the sentence and read it 5 mins	Teacher models writing the sentence they modelled verbally on a sentence strip and reads it aloud again. Prompts students to do the same.	Students write the sentence they said verbally on sentence strip and take turns reading their sentence aloud.
Reading of prose 5 -10 mins	Teacher presents and orients a text at grade 1 level containing rime unit 'aw'	Students read the text and highlight the rime units found in the text with a highlighter.
Review lesson 2 mins	Review what we did today – rime unit we focussed on and strategies used. Present flash cards with words we focussed on today and get them to say them aloud.	Students recap what we did – word and prose level (identifying that we applied words we learnt to read using onset and rime to story) Read loud (hopefully with speed – RAN) words we learnt today.
Meta – phonemic knowledge 3 mins	Teacher explains that knowledge of the rime units and strategies taught will help them when they come to a word they don't know when reading. How breaking words up/chunking them helps us to read unknown words.	Students verbalise what they have learnt today and how this will help them in reading.

Appendix 3: Example of Text used using Fry's

'ick' text

Kate saw a chick looking very sick. She went over and tried to pick it up. It was heavy like a brick. She then tried to poke the chick with a stick. It still didn't move. She lastly tried to flick the chick with her finger. The chick moved and Kate was happy.

Appendix 4: Table used to analyse Rime Units Test

RIME UNIT ANALYSIS

	ack	ame	at	ell	ight	ink	op	ump	ail	an	ate	est	ill	ip	ore	unk	ain	ank	ew
3 sound length																			
4 sound length																			
5 sound length																			

	ice	in	it	ot	ake	ap	ay	ick	ine	ock	uck	ale	ash	east	ide	ing	oke	ug
3 sound length																		
4 sound length																		
5 sound length																		

Two Letter Clusters

br	fr	tr	cr	gr	wr	dr	pr	bl	cl	fl	gl	pl	sl	sc	sk	sm	sn	sp	st	sw	tw

Three Letter Clusters

scr	str	thr	spr	spl	shr	sch	Squ

Consonant Digraphs

ch	sh	th	wh