Action research report

Abstract (200 –300 words) This is a brief overview of the project report. It should include the • hypothesis, • brief outline of the method you used • summary of the findings • their implications.	The hypothesis being investigated is: Training in onset and rime units and phonological awareness will improve the overall reading accuracy of a year four student who has significant delay in reading acquisition. The method used followed an Assessment/Intervention/Assessment model. A single student who had a delay in reading acquisition was selected. Initial assessments were carried out in word recognition, phonological awareness and prose reading accuracy prior to beginning the teaching. The intervention targeted rime units which were explicitly taught to the student. The eight teaching sessions took place on a one-to-one basis between the student and teacher over a period of three weeks. Testing to do with the specific rimes being taught at that session took place at the beginning and end of each rime session. During the session there was language teaching using oral and written language. The teacher modeled both the pronunciation and the writing of the rimes. Kinesthetic learning was also engaged in through the making of the rimes with letter and cluster tiles. Revision of rimes from the previous session took place at the follow up session. The findings indicated that explicit teaching in rime units did improve reading accuracy of words containing that rime unit but did not necessarily transfer to prose reading with words unrelated to the rime units learnt. This would suggest that it is worthwhile exercise to undertake, but perhaps more time needs to be allowed for the transfer of the learning to other words to take place.
Introduction This section indicates • the underlying problem you are examining. • current relevant literature that supports your study • links between the literature and the problem you are examining • the hypothesis you are investigating	Some students experience difficulty in learning to read. There are many aspects which interrelate in the process of gaining proficiency in reading. It is possible however to target and isolate areas which may be causing difficulty to a student in the belief that improvement in a particular area will have an impact on reading as a whole. One area that many students exhibit some difficulty with is the explicit use of rime units. This can impact on overall reading acquisition. Learning to read and write involves giving attention to the onset and rime sound units and linking them to spelling patterns (Juel & Minden-Cupp, 2001). Alongside this is the evidence that phonological awareness is related to reading achievement (Stanovich, Cunningham & Cramer, 1984).

Many researchers have looked at the influence of these aspects, onset and rime and phonological awareness, as elements of reading acquisition. Some have looked at the interaction of the two whilst others have paid particular attention to one or other component. Stanovich (2000) has said that the greatest contribution made to the teaching of reading is the insight that phonological awareness is related to reading achievement.

Adams (1990) highlights five areas of phonological awareness on which teachers should focus. These include phonemic segmentation, manipulation (deletion), syllable splitting (initial/final sounds), blending and oddity identification. Rhyming has also been identified as a focus. All of these tasks have been found to be related to some measures of reading achievement (Stahl & McKenna, 2000). Training in onset and rime lends itself to highlighting the phonological areas of manipulation (deletion), syllable splitting and blending.

Rebecca Treiman (1985,1992) supported, through her research, the use of onset and rime instruction as most effective for children who have some decoding skills and phonological awareness. Children can see patterns in words and establish links between how a particular pattern is said in a particular word and transfer this to other words containing the same pattern (rime). Onset (the initial consonant or consonant cluster of a word) and rime (the vowel and following letter string in rhyme – also referred to as word families or phonograms) have been found to account for children's correct recodings of pseudowords better than phoneme blending (Moustafa, 1995). This research further indicated that most students learn new words by recognising patterns used in known words. Thus, it can be said that people pronounce new words using what they already know about similar words. Richek et al (2002) refer to this as decoding by analogy.

If a child has difficulty discriminating between or among various sound symbols, the teacher should present the child with other words that have the sounds similar to the ones that seem to be causing difficulties. The teacher should also model for the child what he is supposed to do and then they should do some examples together (Rubin, 2002).
Taking these research results into account it seemed prudent to investigate their findings further albeit on a smaller scale than most. The present investigation aims to extend earlier research by examining the influence of explicit teaching and learning of onset and rime units and phonological awareness, on general reading ability. The decision was made to combine the two aspects in the teaching, as they would appear to complement each other in the approach to be taken.

The hypothesis being investigated is:
Training in onset and rime units and phonological awareness will improve the overall reading accuracy of a year four student who has significant delay in reading acquisition.

Method This section should provide enough information to allow the reader to re-do or replicate your study. You should provide information about :
• the participants :
  • who was involved in the project,
  • how they were selected /identified,
  • relevant characteristics (their age, entry abilities in reading, etc).
• the materials you used , the formal / informal assessment measures you used for data collection
• the procedure you followed, for example,
  • what you did (the nature of the activities / intervention),
  • where the project occurred,
  • how often sessions were conducted
• how you use the data you collected.
	Design: The study uses a case study ATA design (Assessing/Teaching/Assessing), in which the gain in recognition and recall of onset and rime units in words and pseudowords and overall reading accuracy, following explicit teaching in onset and rime units and phonological awareness, is monitored for a year four student who has reading difficulties.

Participants: The participant is a year 4 boy (identified as N) who has a history of reading difficulties. N was selected because of his level of reading difficulties and the need to identify other areas of intervention, which could be of assistance in aiding his reading acquisition. N has been part of many different and on-going reading intervention strategies for most of his school life. All of these have resulted in minimal gains to his reading ability. Entry reading level was more than three years below his age level expectation (see Table 1). With N at this level (equivalent to early Grade 1 reading level) it was thought to be appropriate to target onset and rime as it fits into the developmental program for developing phonological and phonemic awareness knowledge (Early Reading Intervention Course notes, Munro, 2002). The activities for Grade 1-2 in segmenting words into sounds and blends include:

- Segment words into onset and rime
- Identify the first sound and the last sound in words
- Segment a word into sounds, tap for each sound, and count the sounds in a word
- Blend onset and rime to make a word
- Blend a sequence of sounds to make a word
- Segment 2- 3- or 4- syllable words into syllables by clapping, say each syllable/sound
- Comprehend short vs long vowel sounds (Part 4, p5)

Because of the level of his difficulties it was decided to concentrate on an intervention which would be aimed at increasing N's word level recognition as this appears to be holding back his progression and ability to employ strategies at any higher text levels when he reads i.e. Sentence, Conceptual, Topic or Dispositional.

Materials: Materials used include the following

- Word reading tasks:
  - Burt Word Reading Test
  - 37 Dependable Rimes Checklist
- Reading rate and accuracy tasks: Reading aloud was assessed using the Neale Analysis of Reading Ability (Neale,1998)
- Sutherland Test of Phonological Awareness (Neilson, 2000)
- 37 dependable onset and rime word lists
- Magnetic letters
- Chunks Word Building Game (Smart Kids)
- First Links – First Rhymes (Macmillan, 1998)
- Rime unit sentences

Procedure

As mentioned above, the study uses an ATA design. The initial assessment stage used tasks in the following order:

1. Burt Word Reading Test
2. 37 Dependable Rimes Checklist
3. Sutherland Phonological Awareness Test (Neilson, 2000)
4. Neale Analysis of Reading Ability (Neale, 1998)

The assessment tasks were administered during separate withdrawal sessions over the period of a week. N did not engage in any specific literacy instruction sessions during the time of testing. Obviously he was part of the regular classroom language sessions during this time, but these did not specifically target phonological awareness or onset and rime.

There were 8 teaching sessions conducted over a three-week period.

N was withdrawn from his classroom to a nearby specialist classroom. Each session lasted for approximately 40 minutes.

Each session targeted three specific rimes and the instruction was completed for one rime then repeated for the next two.

The order in which the rime units were given commenced with two letter rimes then three letter rimes.

The first step with each rime unit was to have N read some sentences which contained words with the rime. Running records were done for these sentences. Next the rime unit was introduced by writing it down and telling N how to say it.

The first activity consisted of using magnetic letters to produce the rime that was being worked on. Different onset letters (single consonants or consonant blends) were then added and substituted. The resulting words or pseudowords were then said along with any other rhyming words that N could think of. The words were broken up into onset and rime units when first said, then repeated as whole words.

Next the teacher wrote a list of the onset and rime group that N had been making with the letters and any other words using the rime that N had produced orally. The list was then read by the teacher and N together.

Using the "Chunks" tiles N then made the words on the list.
He then wrote each of the words as he made them with the tiles.
Lastly N read the words he had written.

As a reinforcement of the rime unit N then read through the "First Rhymes" booklet (Macmillan, 1998), corresponding to the rime unit he had just studied.

After he had finished this he then re-read the same sentences, containing the rimes, that he had read at the beginning of the session. Another running record was made.

This process was repeated with the other rime groups that had been looked at for that session.

After the session, the teacher re-wrote the list of words onto a card, which was taken to the following session for N to read through as a revision.

Subsequent sessions began with N reading through the three cards of rimes from the previous session before proceeding with the day's rimes.

In all 24 rime units were targeted over the period of the study. Each of these was the subject of explicit teaching of the rime and the associated phonological awareness skills that went with it.

Results	*Observations of the student*
This section should contain an analysis of the data you obtained.	The results of the time series, (results obtained when testing took place soon after the teaching was implemented) and the post intervention results, are contained in Table 2 and Table 3 respectively. (In Results file)

The time series results indicated higher levels of gain than the post intervention test results. N made gains in the reading of every rime unit studied. Using the time series results, N's gains (comparing reading prior to rime unit being taught and post teaching) ranged between 16% and 100%. The trends with all rimes taught indicated that the intervention made a difference to the students capabilities for reading rime units both immediately after the teaching (time series) and after the completion of the intervention (post intervention results). The overall increases in the correct reading of all the words in the sentences ranged between gains of 11 and 30%.

Post intervention results for reading of the rime units in isolation (Dependable Rimes Checklist) showed an increase, in the number of words or pseudowords read correctly, of 44% on pre-intervention words read correctly. These results show an improvement in the N's ability to read rime units.

In the Sutherland Phonological Awareness tests N 's score increased by 10 points or 17%. The breakdown of these increases was Phonemic Level (cvc) up 6%, Phonemic Level (blends) up 42% and Grapheme-Phoneme Correspondences up 29%. This raised N's overall score for Phonological Awareness, from below grade 1 level to grade 3 level. These results show an increased ability in Phonological Awareness.

With the Burt Word test N increased his score for reading of isolated words, not connected to the rime units taught, of 4 points or 10 %. These results showed a marginal increase in reading of isolated words.

In the Neale Analysis of Reading Ability Revised (Neale, 1998), N made no gains in prose reading accuracy from testing prior to intervention and post intervention.

These data show that explicit teaching of rime units improved reading of words containing the rime unit as well as words unrelated to the particular rime units taught. There was improvement in reading prose in single sentences but not in the longer prose passages as appear in the Neale.

Looking at the results obtained it can be said that the majority of the data matches the original hypothesis that: Training in onset and rime units and phonological awareness will improve the overall reading accuracy of a year four student who has significant delay in reading acquisition. |

Discussion	It appears that the hypothesis has been supported to a large degree by the results obtained in the study. On all occasion N's recall of the rime units in the sentences indicated he had learnt the rime sufficiently to recall it when he was presented with it again. Even when he presented to the sessions in a less than co-operative frame of mind (depending on what was being missed in the classroom) he was still able to learn, and retain successfully, the rime units taught.
In this section • interpret the data you have collected in relation to your hypothesis. This may include possible reasons for why unexpected results were obtained. • discuss implications for teaching practice. • directions for future research.	N's attitude to reading had been quite negative according to his teachers. He would refuse to "have-a-go" at words and would go through a piece of reading saying "don't know" to almost every second word. He refused to even attempt words, which he did not instantly recognise. Over the time of the intervention, his attitude changed markedly. He surprised himself with how he was able to read the sentences after he had been taught the rime units and was extremely pleased with his own progress. The next stage for N is to continue with the MLOTP Model to go through the sequential levels of reading words efficiently. From here N can then progress through the sequences for sentence, conceptual, topic and eventually, dispositional levels. Explicit teaching through these stages will be necessary and advantageous for N. The findings from the study seem to correlate well with the researchers who were mentioned earlier. From the results, it seems clear that phonological awareness is indeed related to reading achievement (Stanovich, Cunningham & Cramer, 1984, Stahl & McKenna, 2000), at least to the achievement of reading rime units. There was a direct link between the rise in the levels of correct reading of rime units and the acquisition of a higher level of phonological awareness, particularly in the area of blends. Whether it is the rime learning that influences on phonological awareness or vice versa is probably still debatable. There are definite implications for teaching practice which emerge from this study. The student taking part obviously has many difficulties with his reading but onset and rime recognition, manipulation and transfer is definitely an area he has missed out on. It would seem quite evident from research that this is an important area for children in learning to read and it seems equally clear that some children do not automatically pick it up and run with it. There is a need for explicit teaching of rimes in the general classroom for some children to put in place what they know. This teaching should also include the emphasis on the phonological awareness skills involved. Some children gain automation themselves while others

need to be told that they know about rimes and can use them. Some specific testing (rime units checklist) may be in order, perhaps at the end of Grade 1, so that early intervention can be taken to set this easily identified aspect of reading in place.

With regards to this particular study, there are some things that could have been done differently. It would possibly have been better to target less rimes per session and to have run the sessions over a longer time frame, perhaps a term. The option is also there with more time to engage several students in a small group and work through the study this way.
More opportunities could be given for prose reading both containing and not containing the studied rimes.

Some future research could be undertaken to extend studies in this area.

Looking at the correlation between rime unit knowledge and overall reading levels would be informative. Would it be likely to find that all good readers have a high level of automation when it comes to recognition and reading words by analogy whilst poor readers have low levels of rime recognition?

Another area, which would be interesting to examine, is the correlation between rime recognition and analogy and reader levels within the Sutherland Test of Phonological Awareness.

Overall, it appears that gaining of rime unit knowledge will in general aid in reading acquisition in children. The most important aspect though is that teachers in the classrooms need to be aware of what methods are effective for what children and to ensure that all children are catered for and their language needs carefully monitored.

References / Bibliography	Books and Articles
Style Guide Format recommended.	Adams, M.J. (1990). *Beginning to read: thinking and learning about print.* Cambridge, Mass: MIT Press.
	Juel, C. & Minden-Cupp, C. (2001). Learning To Read Words: Linguistic Units and Strategies. University of Virginia Retrieved 01/06/02 from www.ciera.org/library/reports/inquiry-1/1-008/Report%201-008.html
	Moustafa, M. (1995). Children's Productive Phonological Recoding. *Reading Research Quarterly,* v30 n3 p464-76 Jul-Sep 1995
	Munro, J. K. (2002) Early Reading Intervention Course Notes. University of Melbourne
	Richek, M et al (2002). *Reading Problems – Assessment & Teaching Strategies* (4th ed.) Boston: Allyn & Bacon.
	Rubin, D. (2002). *Diagnosis and Correction in Reading Instruction* (4th ed) Boston: Allyn & Bacon
	Stahl, S. & McKenna, M. (2000). The Concurrent Development of Phonological Awareness, Word Recognition and Spelling. Retrieved on 02/06/02 from http://www.ciera.org/library/archive/2001-07/200107.htm
	Stanovich, K. (2000) *Progress in Understanding Reading: scientific foundations and new frontiers.* New York: Guilford Press
	Stanovich, K., Cunningham, A. & Cramer, B. (1984). Assessing phonological awareness in kindergarten children: issues of task comparability. *Journal of Experimental Child Psychology.* 38, 175-190
	Treiman, R. (1985). Onset and rimes as units of spoken syllables: evidence from children. *Journal of Experimental Child Psychology.* 39, 161-181
	Treiman, R. (1992). The role of intrasyllabic units in learning to read and spell. In Gough, Ehri & Treiman (Ed), Reading Acquisition (pp65-106). NJ : Erlbaum
	Test Materials
	Burt Word Reading Test (1981), New Zealand Council for Educational Research
	Neale, M. (1998) Neale Analysis of Reading Ability (Revised) Camberwell: ACER
	Neilson, R., (2000) Sutherland Test of Phonological Awareness

	Chunks Word Building Game (Smart Kids)
	First Links – First Rhymes (Macmillan, 1998)

Appendix

Describe your teaching unit in an appendix.

For the unit,

This unit requires the specific teaching of dependable rime units to a student. By following this intervention, the student will be able to gain knowledge of onset and rime units and transfer this knowledge to prose reading. In the model of Multiple Levels of Text Processing (Munro, 2001) this intervention unit fits into word level. It works on the letter cluster-sound links and follows the first stages of the recommended sequence of reading each word, reading each word in segments, blending letter clusters and noting how the words are similar.	Examples: - improve knowledge of onset and rime units - segment words into onset and rime - blend onset and rime to make a word - blend a sequence of sounds to make a word
Describe the activity - what teacher will do in steps, the instructional language used to teach it, the materials to be used - what children will do - what does it assume students already know / can do ? - how will key behaviours taught be stored in memory / transferred ?	There are 8 teaching sessions conducted over a two-week period. The following materials are required: - Word reading tasks: - Burt Word Reading Test 37 Dependable Rimes Checklist - Reading rate and accuracy tasks: Reading aloud will be assessed using the Neale Analysis of Reading Ability (Neale,1998) - Sutherland Test of Phonological Awareness (Neilson, 2000) 37 dependable onset and rime word lists - Magnetic letters - Chunks Word Building Game (Smart Kids) - First Links – First Rhymes (Macmillan, 1998) - Rime unit sentences Prior to commencement of the intervention the students are given the following tests: - Word reading tasks: - Burt Word Reading Test 37 Dependable Rimes Checklist - Reading rate and accuracy tasks: Reading aloud will be

assessed using the Neale Analysis of Reading Ability (Neale, 1998)

- Sutherland Test of Phonological Awareness (Neilson, 2000)

The rime unit sentences included can be used in the intervention or equivalent sentences constructed by the teacher with the student's interests and knowledge in mind.

The student is withdrawn from the classroom to a nearby specialist classroom. Each session lasts for approximately 40 minutes.

Each session targets three specific rimes and the instruction is completed for one rime then repeated for the next two.

The order in which the rime units are given commences with two letter rimes then three letter rimes. For this intervention, 24 rime units are chosen. There is flexibility in the choice of rimes.

1. The first step with each rime unit is to have the student read some sentences, which contain words with the rime. A running record is done for these sentences. (Make sure copies of sentences are ready for teacher to use)

2. Next the chosen rime unit is introduced by writing it down and telling the student how to say it. The teacher writes the rime then says it. " a n says an. Whenever you see "an" in a word it says 'an'." Teacher says rime with student, student repeats alone.

3. The first activity consists of using magnetic letters to produce the rime that is being worked on e.g. put the letters a and n together to make the rime 'an'. T – "a n says an"
Different onset letters (single consonants or consonant blends) are then added and substituted. The resulting words or pseudowords are then said along with any other rhyming words that the student can think of.
The words are broken up into onset and rime units when first said, then repeated as whole words. (Phonological Awareness emphasis) T – " c – an says can"

4. Next the teacher writes a list of the onset and rime group that the student has been making with the letters and any other words using the rime that the student has produced orally. The list is then read by the teacher and student together.

5. Using the "Chunks" tiles the student then makes the words on the list. Saying each word in its onset and rime format then as a whole word. S- "c – an, can"

6. The student then writes each of the words as he makes them

with the tiles.

7. Lastly the student reads the words he has written as onset and rime and whole words.

8. As a reinforcement of the rime unit the student then reads the "First Rhymes" booklet (Macmillan, 1998), corresponding to the rime unit he has just studied.

9. After the student has finished this he then re-reads the same sentences, containing the rimes that he had read at the beginning of the session. Another running record is made by the teacher.

This process is repeated with the other rime groups that are being looked at for that session.

10. After the session the teacher re-writes the list of words onto a card (with the rime in the same colour in each word), which is taken to the following session for the student to read through as a revision.

Subsequent sessions begin with the student reading the three cards of rimes from the previous session before proceeding with the day's rimes.

In all 24 rime units are targeted over the period of the study. Each of these is the subject of explicit teaching of the rime and the associated phonological awareness skills that go with it.

11. At the conclusion of the intervention the original tests are required to be re-administered and results compared with tests given prior to the teaching.

(See examples in Appendix)

specify the format • the grade level • format - small group, individual, large group	This intervention was used with a year 4 student who was experiencing significant difficulty in reading. The reading level targeted is around year 1 reading level. The format used is individual but, depending on the students, could be used in a small group format.