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An Analysis of Rx for Discovery Reading for Elementary Students Below Grade Level in Reading

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Introduction

"Reading is the fundamental skill upon which all formal education depends. Research now shows that a child who does [not] learn the reading basics early is unlikely to learn them at all. Any child who does [not] learn to read early and well will not easily master other skills and knowledge, and is unlikely to ever flourish in school or in life" (Moats, 1999, p. 5). Approximately twenty percent of students in elementary schools nationwide have significant struggles in learning to read; another twenty percent lack the ability to read fluently enough to be able to engage in reading independently. Twenty-five percent of the adult population in America lacks the basic literacy skills that are required to succeed in a typical job (Moats, 1999). The question thus becomes: "What is the best way to teach this ability to construct meaning from the written text?"

In the history of American education, reading instruction has varied. With the pendulum swinging between explicit teaching of phonics to using whole language exclusively, there are millions of children who traversed their academic careers while continuing to struggle with the acquisition of efficient reading ability (Cowen, 2003, p. vii).

In 1997, Congress instructed the National Institute of Child Health and Human Development to convene a national panel of reading experts (National Institute of Child Health and Human Development [NICHHD], 2000). Their task was to "assess the status of research-based knowledge, including the effectiveness of various approaches to teaching children to read" (NICHHD, 2000, p. 1-1).

The National Reading Panel (NRP) showed that there are five specific areas of reading instruction that impact teaching children to read. Instruction in phonemic awareness, phonics, fluency, vocabulary and comprehension was shown to be the most effective and complete program of reading education (NICHHD, 2000).

Background of the Study

Rx for Discovery Reading® is a program developed by the National Institute for Learning Development (NILD) that includes each specific area of reading instruction delineated by the NRP. NILD, as an organization, was established in 1982. Deborah Zimmerman, working with Dr. Rosa Hagin and Dr. Archie Silver, researchers at Bellevue Psychiatric Hospital in New York City, developed the specific intervention method used by NILD. Zimmerman worked initially with stroke patients and then moved to schools and clinics, working with children who had not learned to read well. Her method relied on deficit stimulation to impact perception and cognition rather than relying on a compensatory method of instruction, which relies on a student's strengths to overcome weaknesses (NILD, 2004, p. I-9).

Beginning in 1973, Grace Mutzabaugh, the lower school principal at Norfolk Christian Schools in Norfolk, Virginia, began working with Zimmerman to establish the method of deficit stimulation for the students at her school. As principal, she had told too many parents that Norfolk Christian School could not meet the needs of their child that struggled. Mutzabaugh wanted to reach out to these students, believing that the Lord had called this Christian school to meet the needs of every student, even those with special needs. By 1982, the program became known as NILD Educational Therapy®. Currently, through the use of twenty-five techniques, students receive intense, individual stimulation through guided questioning and interactive

language, working with a human mediator, moving toward independent learning in the classroom (NILD, 2004, I-7).

Although NILD has been intervening in students' reading deficits for over twenty-five years, the delivery method has been on an individual basis, impacting the student's processing deficits in the areas of visual, auditory and/or cognitive processing. Realizing that the one-on-one delivery is an expensive mode of delivery, especially in many school environments, an experimental group model, *Rx for Discovery Reading®,* was developed. The program was initiated as a stream-lined intervention for small group implementation for students below level in reading. At present the focus is on the areas of phonemic awareness, phonics, and fluency, which impact the student's reading deficits. Vocabulary and comprehension building strategies will be added to the program in the future. The program includes *The Blue Book Method*, *Sounds of Speech,* and *Sounds of Reading* along with reading texts for practice in reading fluency with prosody.

Problem Statement

Because this is a new intervention that has not been previously studied, this research project sought to answer the following question: What is the effect of the *Rx for Discovery Reading®* program on the reading abilities of second, third, fourth, and fifth graders who were below grade level in reading?

Professional Significance of the Study

When the NRP was initially established, the task was to find why so many students' "educational careers are imperiled because they do not read well enough to insure understanding" (Snow, Burns, & Griffin, 1998, p. 1). When reading instruction is effective, it is built on a foundation of many factors. Although reading's main purpose is obtaining meaning

from print, understanding the alphabetic code is foundational. Students must develop an understanding of the sound/symbol concept as well as have practice with a variety of texts to develop fluency. Background knowledge, including vocabulary acquisition, helps form meaning and interest in written text. Procedures for monitoring comprehension must be taught. Interest and motivation in reading also need to be developed (Snow, et al., 1998; NICHHD, 2000). Each of these areas is an integral part of *Rx for Discovery Reading*.

Strategies for Reading Instruction

Phonological Processing

Phonological awareness is the broad area of understanding the sound/symbol relationships of the alphabetic code. Phonological awareness is the ability to generate rhymes, identify and work with syllables, and identify and work with onsets and rimes in syllables (Armbruster & Osborn, 2001).

Phonemic awareness is the more specific end of the phonological awareness spectrum. Phonemic awareness provides a foundation for learning to read and spell (Gillingham & Stillman, 1997). At this level, the student is able to focus on and manipulate individual sounds involving identification, isolation, segmentation, deletion, addition, substitution, categorization, and blending to create new words. (Armbruster et al., 2001). “Phonemic awareness can be developed through systematic practice in categorizing words on the basis of common beginning, middle, and end sounds” (Pressley, 1998, p. 98). The NRP found that phonemic awareness can be taught and learned in a relatively short amount of time (NICHHD, 2000; International Reading Association [IRA], 2002). After participating in a program of intense phonemic awareness instruction that is purposeful and deliberate for eleven to fifteen hours, a student may have significant gains in phonological processing (IRA, 2002; Yopp & Yopp, 2000).

Phonemic awareness instruction is more effective when it focuses on one to two types of phoneme manipulation. It is also more beneficial when used in a small group setting in which children benefit from listening to others in the group and receiving feedback from the instructor (Armbruster, et al., 2001; NICHHD, 2000; Mathes, Denton, Fletcher, Anthony, Francis, & Shatschneider, 2005).

Fluency

A fluent reader is one who reads with prosody, focusing on the meaning of the language, and has developed automaticity in processing the form of the language (Snow, et al., 1998; IRA, 2002). These are considered the central elements of reading fluency (Kuhn & Stahl, 2000). When a student continues to struggle with decoding the language, the student exhibits slow, choppy reading, depending on decoding skills to decipher words. Most of the student's cognitive abilities are spent processing the form of the language. Consequently, fluency cannot be established and comprehension of the material is inhibited (Snow, et al., 1998; NICHHD, 2000; Armbruster, et al., 2001; Samuels, 2002; Pikulski & Chard, 2005).

Fluency instruction for struggling readers needs to include a variety of strategies. These strategies include repeated and monitored oral reading, which improves fluency and overall reading achievement (Armbruster, et al., 2001, p. 24; NICHHD, 2000; Pikulski & Chard, 2005). Assisted reading (Neurological Impress Method) or reading while listening allows students to hear and practice fluent reading, practicing until they can read the text fluently with prosody (Rasinski, 2006; Pikulski & Chard, 2005; Osborn & Lehr, 2003). Increased amount of reading is important because as words are encountered repeatedly, improvement in word recognition, speed, ease of reading and comprehension is developed (Samuels, 2002, p. 174; Pikulski & Chard, 2005). Continued practice reading "sight words" so that automaticity is developed is also

an important strategy. The "sight word" variable is strongly related to text reading rate (Torgesen, et al., 2006; Pikulski & Chard, 2005).

Repeated Oral Reading

Repeated oral reading is a strategy in which students read and reread a selection of text many times to improve reading fluency. Improvement is developed in prosody, word recognition accuracy and reading speed (Samuels, 2002). "Through repeated readings, even dysfluent readers are more able to capture the prosodic and syntactic essence of the text, thus improving the surface-level processing of the passage as well as text comprehension" (Rasinski, 2006, p. 14). "The greater support given to readers through repeated readings of instructional text in various venues and with various procedures, children are able to learn from material that they initially read with significant difficulty" (Stahl & Heubach, 2005).

Significant growth in reading level and reading rate has been found when students complete repeated readings of phonics and sight phrases, and oral reading of text selections for as little as five minutes at a time (Mercer, Campbell, Miller, Mercer, & Lane, 2000; Dowhower, 1987). It is more effective when the succession of readings has overlapping words, such that students develop reading speed as they gain recognition and automaticity decoding familiar words (Rashotte & Torgesen, 1985). "Each passage is read only four times, because research by O'Shea, Sindelar, & O'Shea (1985) has shown that most of the gains in reading speed, word recognition, error reduction, and expression in oral reading are acquired by the fourth reading" (Samuels, 2002, p. 178).

Neurological Impress Method

The neurological impress method is used to improve prosody. The instructor reads aloud in unison with the student (Heckelman, 1969). It is one of the easiest and most cost-effective

methods of developing fluency. The teacher positively reinforces the student's reading throughout the exercise. Students participating in this method for as few as three to seven hours over a few weeks made significant gains in reading fluency (Flood, Lapp, & Fisher, 2005; Rasinski & Hoffman, 2003; McAllister, 1989).

Sight Words

Direct instruction of sight words can impact student reading rate and fluency. Skilled readers develop a large volume of sight words. Teaching the words directly with immediate feedback aids students in the acquisition and retention of words. By developing a sight word vocabulary, a student reads more fluently (Tucker, 1989; Singh & Singh, 1988; Frantantoni, 1999).

Small Group Instruction

Small group instruction is an effective model in learning to read. Children benefit from being able to listen to the other students' responses with feedback from the teacher (Armbruster & Osborn, 2001): "Struggling readers need more time in small groups in which instruction is targeted to their level of competence" (Walpole, Justice, & Invernizzi, 2004, p. 279). By making task demands match with student competence, small group instruction promotes more effective student engagement, affording more student success (Walpole, et al., p. 279).

Methodology

Subjects

The twenty-nine second- through fifth-grade subjects in this field test attended private parochial schools in a variety of areas in the United States and Canada. They represented Caucasian, African-American and Latin ethnicity. The criterion for placement was achievement

below grade level in reading, based on the annual standardized test scores. Each educational therapist worked with a small group of three to four students.

Instruments

The field test was a quasi-experimental study using pre- and post-test standard scores. The *Kaufman Test of Educational Achievement, Second Edition (KTEA-II)* standard reading battery and supplemental reading subtests ascertained the current levels in letter/word recognition, nonsense word decoding, phonological awareness, word recognition fluency, and decoding fluency.

Also included was the *Gray Oral Reading Test (GORT)* to ascertain oral reading proficiency. The *Dynamic Indicators of Basic Early Literacy Skill* (*DIBELS),* curriculum-based measures, was administered three separate times. *DIBELS* includes a set of measures that are standardized and individually administered for assessing early literacy development.

Procedures

Prior to the beginning of the new school year, the educational therapists screened students in order to identify subjects for participation. The program was implemented throughout the school year. The subjects met for two forty-five minute sessions weekly for a total of fifty sessions. The *DIBELS* was administered during pre-testing, after the twentieth session and after the last session. The post-testing was completed following the fiftieth session.

Results

The relationships of the pre- and post-test standard scores from the *KTEA-II* and the *GORT* were explored using measures of deviation from normality and paired samples t-tests. Fluency growth from *DIBELS* will be demonstrated using a histogram for each grade level.

In the area of phonological processing, the t-tests indicate a significance value of .000. In phonics, the subtests on the *KTEA-II* and the *GORT* show a significance value of .001 and .000. The subtests used to ascertain gains in fluency on the *KTEA-II* and the *GORT* show a significance value of .000, .003 and .006. These show a statistically significant difference in the areas of phonological processing, phonics, decoding fluency, word recognition fluency, and fluency scores on the *KTEA-II* and *GORT* . The *GORT* subtest, Rate, which is the amount of time a student took to read a story, did not have a statistically significant difference in the values. The statistical results are shown on the chart that follows:

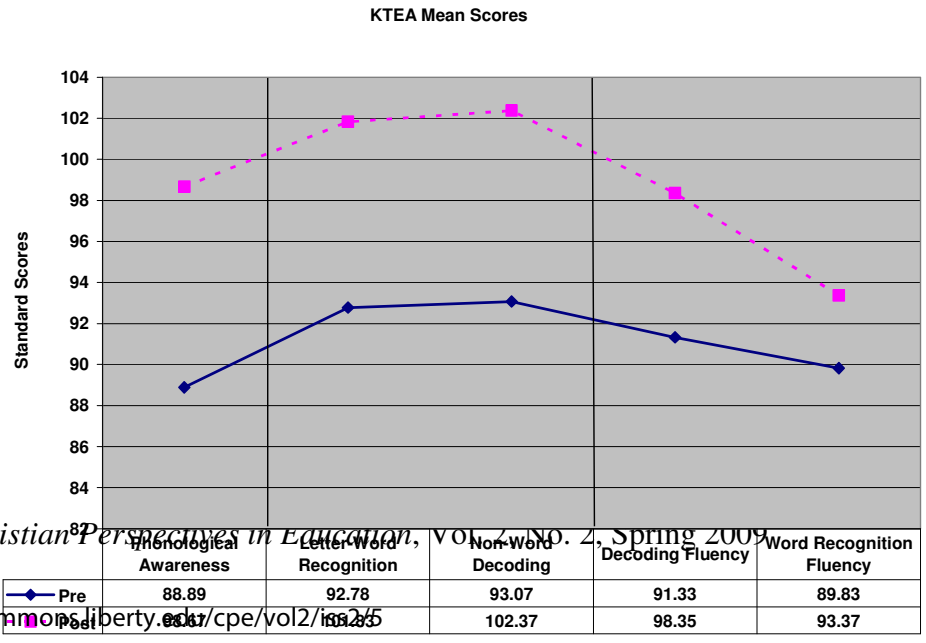
Figure 1: T-test Scores for Subtests

Subtest		**# Students**	**Skewness**		**Kurtosis**		**Mean**	**Std. Deviation**	***t*-test**	**Sig. (2-tailed)**
			Stat	Std. Error	Stat	Std. Error	Paired Differences			
KTEA-II										
Phono. Awareness	Pre	29	-.263	.448	-.659	.872	-9.778	11.277	-4.505	.000
	Post	29	-.246	.448	-.923	.872				
Letter-Word Recognition	Pre	25	.408	.481	-.611	.935	-9.043	10.658	-4.069	.001
	Post	25	1.068	.481	0.186	.935				
Non-Word Decoding	Pre	29	-.697	.448	.383	.872	-9.296	8.484	-5.693	.000
	Post	29	.018	.448	-.444	.872				
Decoding Fluency	Pre	26	-.439	.472	-.302	.918	-6.833	8.019	-4.174	.000
	Post	28	-.047	.456	-.568	.887				
Word	Pre	26	-.562	.472	.417	.918	-3.625	5.822	-3.050	.006

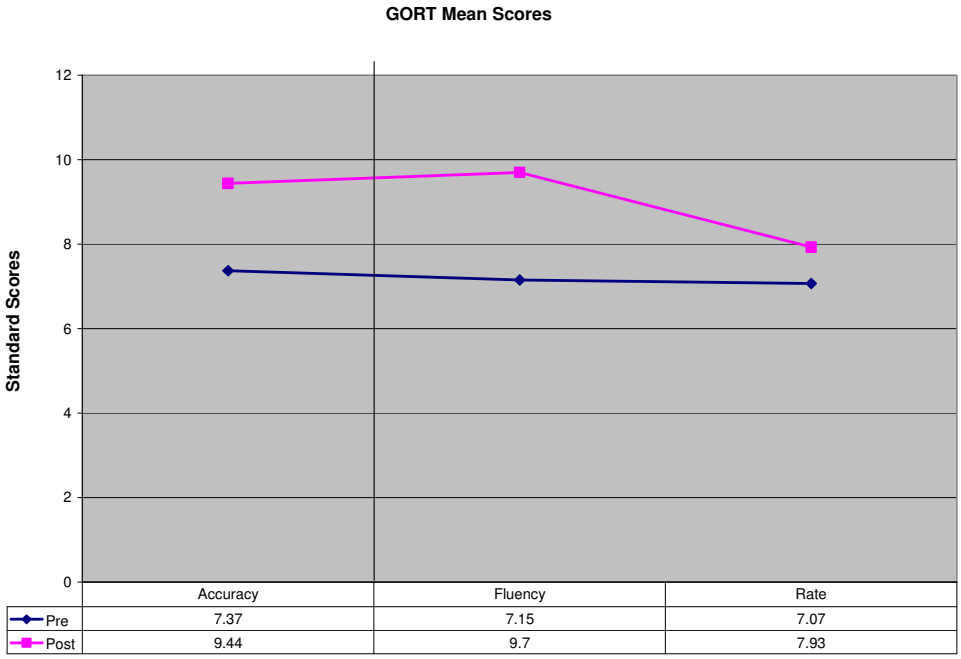
Recog. Fluency	Post	29	-.761	.448	1.349	.872				
GORT-4										
Accuracy	Pre	29	.275	.448	-.061	.872	-2.074	2.895	-3.723	.001
	Post	29	-.656	.448	-.582	.872				
Fluency	Pre	29	1.253	.448	2.561	.872	-2.556	4.022	-3.301	.003
	Post	29	-.042	.448	-.283	.872				
Rate	Pre	29	.290	.448	-.063	.872	-.851	2.597	-1.704	.100
	Post	29	-.320	.448	-.873	.872				

The following graphs show the comparison on the mean pre- and post-test standard scores on the *KTEA-II* (Graph 1) and the *GORT* (Graph 2). The graphs have been divided into the specific subtests assessing the delineated areas of phonological processing, decoding (phonics) and fluency. The line graphs show the growth that the sample had in the three areas of reading according to the mean scores.

Graph 1: *KTEA-II* Pre- and post-test Mean Standard Scores

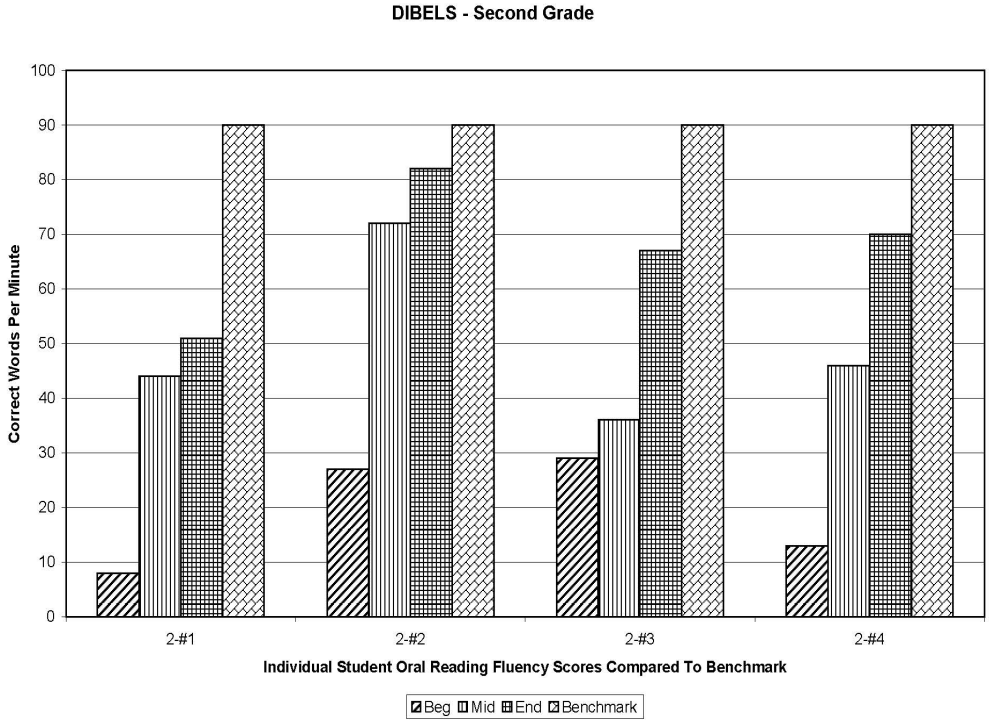


Graph 2: *GORT* Pre- and post-test Mean Standard Scores

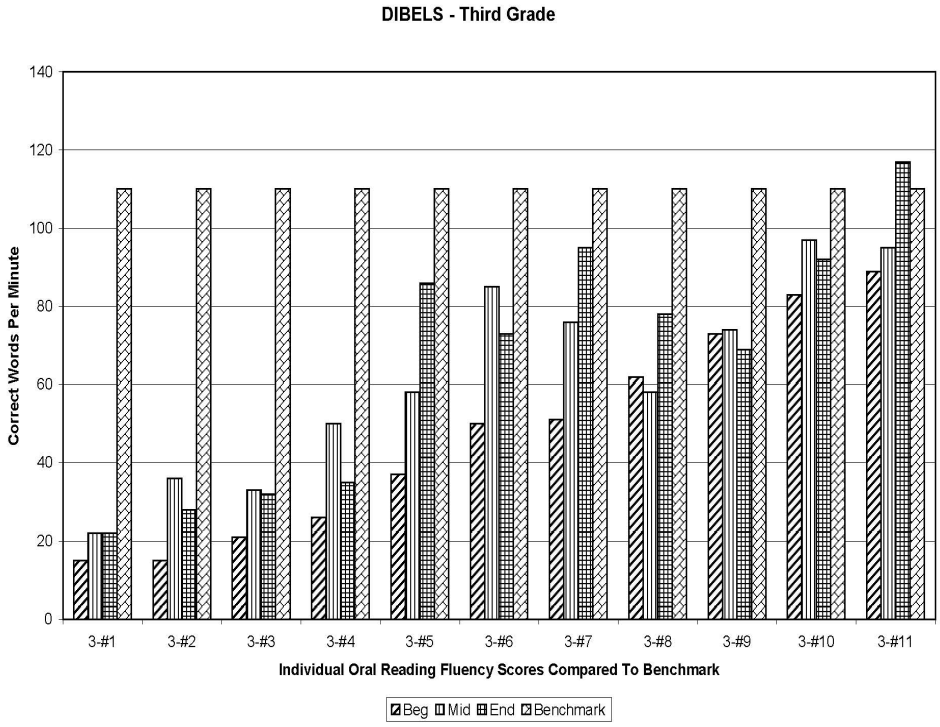


In the following graphs (3-6), the three one-minute timed readings completed during the study show the growth in fluency from the initial reading on the left to the final reading on the right. Each grade level showed growth in fluent reading, but only fourth graders moved up to the baseline established by the University of Oregon for grade level reading.

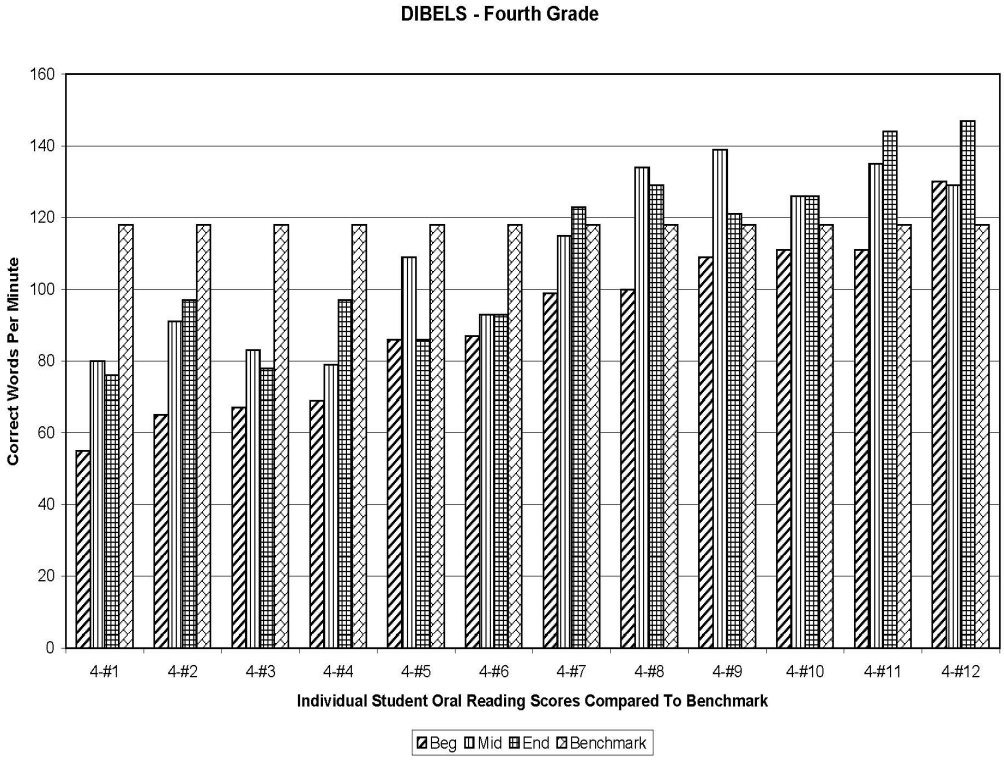
Graph 3: Comparison of Three One-Minute Timed Oral Readings in *DIBELS* with University of Oregon's Established Graded Benchmarks for End of Year Fluency – Second Grade



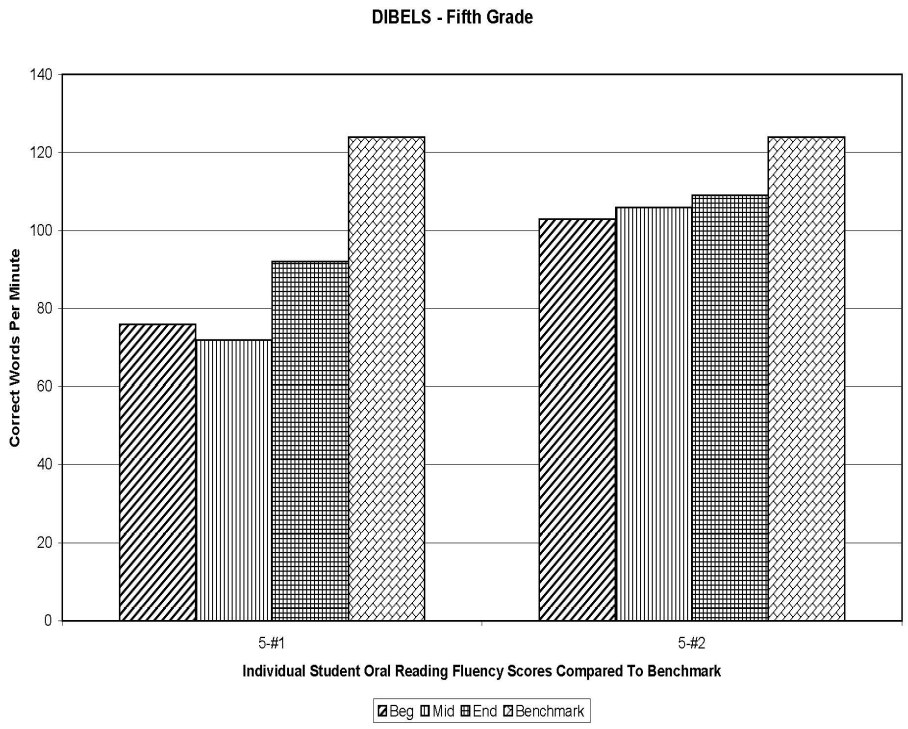
Graph 4: Comparison of Three One-Minute Timed Oral Readings in *DIBELS* with University of Oregon's Established Graded Benchmarks for End of Year Fluency – Third Grade


DIBELS - Third Grade
Correct Words Per Minute
140
120
100
80
60
40
20
0
3-#1
3-#2
3-#3
3-#4
3-#5
3-#6
3-#7
3-#8
3-#9
3-#10
3-#11
Individual Oral Reading Fluency Scores Compared To Benchmark
Beg
Mid
End
Benchmark

Graph 5: Comparison of Three One-Minute Timed Oral Readings in *DIBELS* with University of Oregon's Established Graded Benchmarks for End of Year Fluency – Fourth Grade



Graph 6: Comparison of Three One-Minute Timed Oral Readings in *DIBELS* with University of Oregon's Established Graded Benchmarks for End of Year Fluency – Fifth Grade



The results documented above indicate that for the three areas of reading ability examined in this school year-long field test, there appeared to be statistically significant differences between the pre- and post-testing mean standard scores for the students participating in the study.

Discussion

After a review of the objectives of the study, the problem being studied, the hypotheses, the statistical analyses of the data, the following conclusions may be drawn from this study:

1. Students participating in the study made significant gains from their pre- to their post-testing standard scores in the area of phonological processing.

The meta-analysis completed by the National Reading Panel in 2000 indicated that phonological processing can be improved in a relatively short amount of time (NICHHD). Yopp and Yopp (2000) indicated that students participating for eleven to fifteen hours in a program of intense phonemic awareness instruction that is purposeful and deliberate may have significant gains in their phonological processing. Research indicates that phonemic instruction is more beneficial when implemented in a small group setting because the students benefit from listening to others in the group and receiving immediate feedback from the instructor (Armbruster, et al., 2001; NICHHD, 2000; Mathes, et al., 2005).

2. Students participating in the study made significant gains from their pre- to their post-testing standard scores in the area of decoding ability.

Chall, in her revolutionary work, *Learning to Read: The Great Debate,* found that when code emphasis was used, students seemed to develop more proficient word recognition skills and improve in oral reading ability. Receiving systematic phonics instruction while relying on direct teaching of the sound/symbol relationship, students became more successful in reading (1967). Adams indicated in 1999 that connecting systematic code instruction with meaning emphasis, language instruction and connected reading results in superior reading achievement overall. She also concluded that this holds true for students with low reading-readiness profiles. The evidence

supports the previous research findings that explicit instruction in the phonological structure of oral language and the connections of phonemes and spellings help students grasp the alphabetic principle on which reading relies (Snow, et al., 1998).

3. Students participating in the study made significant gains from their pre- to their post-testing standard scores in the area of fluent reading.

Fluent reading is the foundation of reading for meaning. Research has shown there is a close relationship between fluency and comprehension (Pinnell, et al., 1995). The National Reading Panel reported that among the most effective methods for developing fluent reading was the use of repeated oral reading and the neurological impress method. According to the Panel, these methods showed a positive and a consistent impact on the student's word recognition skills and fluency abilities, leading to a more developed ability to comprehend the text (2000). *Rx for Discovery Reading*® uses both methods in working with students to develop fluent reading.

Dowhower found that repeated oral reading increased speed and accuracy in unpracticed passages, aided students in segmenting text into more meaningful phrases and developed gains in comprehension (1989). Torgesen, in his research in 2001, found that repeated oral reading provided the kind of repeated exposure to words that would lead to development of new orthographic images and would increase the student's efficiency to access images that had already been formed.

Heckelman developed the neurological impress method (N. I. M.) in 1969 to impact a student's fluent reading ability. He believed that some students with reading disability become too reliant on decoding without moving to fluent reading. Flood, Lapp and Fisher found that, although the N. I. M. appeared to be a simple method, it had a great effect on a student's ability

to read more fluently. They also concluded that it helped develop a more positive attitude and motivation toward reading (2005).

Conclusion

In today's educational environments, educators are faced with an incredible number of students struggling with the inability to acquire proficient reading skills. Because of a growing amount of research in the field of reading, there are unprecedented opportunities for educators to help students become better readers. *Rx for Discovery Reading*® provides a research-supported intervention. It is hoped that more educators will become involved in providing this intervention to impact the lives of children.

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