Improved Reading Achievement by Students in Oregon City School District who used Fast ForWord® Products

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ABSTRACT

Purpose: This study investigated the effects of the Fast ForWord products on the reading achievement of elementary school students who used the products within the curriculum in a school setting. **Study Design:** The design of this study was a multiple school case study using state assessment tests. **Participants:** Study participants were third and fourth grade students attending four schools in the Oregon City School District in Oregon, Ohio. The students were struggling to reach grade-appropriate reading proficiency. **Materials & Implementation:** Following staff training on the Fast ForWord products, a group of third and fourth graders used the products during the 2003 – 2004 school year. In October of 2003, before Fast ForWord use and in March of 2004, after Fast ForWord participation, third grade students were evaluated with the Ohio Achievement Test (OAT) and fourth graders were evaluated with the Ohio Proficiency Test (OPT). **Results:** On average, students made significant improvements in reading achievement, with 69% of the students improving one or more levels on the state assessment and 47% achieving proficiency.

Keywords: Ohio, public elementary school, suburban, observational study, Fast ForWord Language, Fast ForWord Language to Reading, Ohio Proficiency Test (OPT), Ohio Achievement Test (OAT).

INTRODUCTION

Numerous research studies have shown that cognitive and oral language skills are under-developed in struggling readers, limiting their academic progress (Lyon, 1996). University-based research studies reported the development of a computer software product that focused on learning and cognitive skills, and provided an optimal learning environment for building the memory, attention, processing and sequencing skills critical for reading success (Merzenich et al., 1996; Tallal et al., 1996). This prototype of the Fast ForWord Language software showed that an optimal learning environment and focus on early reading and cognitive skills resulted in dramatic improvements in the auditory processing and language skills of school children who had specific language impairments (Merzenich et al, 1996; Tallal et al., 1996) or were experiencing academic reading failure (Miller et al., 1999). The Oregon City School District was interested in evaluating the effectiveness of an optimal learning environment with a focus on early reading and cognitive skills as a way for improving the reading achievement of students in a school setting. In this study, commercially available computer-based products (Fast ForWord Language and Fast ForWord Language to Reading) were used to evaluate the effectiveness of this approach for improving the reading achievement of elementary school students.

METHODS

Participants

The Oregon City School District is located in Oregon City, Ohio, the second largest city in Lucas County. The Oregon City School District, with seven schools, serves over 3,800 students in pre-Kindergarten to twelfth grade. Four of the elementary schools in this district chose to use the Fast ForWord products during the 2003 – 2004 school year. Third and fourth graders from the four elementary schools (Coy, Jerusalem, Starr and Wynn) participated in this study.

In October of 2003 and in March of 2004, third grade students were assessed with the Ohio Achievement Test (OAT) and fourth graders were evaluated with the Ohio Proficiency Test (OPT). The students in this study started using Fast ForWord products between the two assessments. Some students completed the Fast ForWord products before the post-test in March; the other students continued participating on the products through April and May. Thirty-six students had either OAT or OPT scores available for analysis and were included in this study. School personnel administered the assessments and reported scores for analysis.

Implementation

At each participating school, educators were trained in current and established neuroscience findings on how

phonemic awareness and the acoustic properties of speech impact rapid development of language and reading skills; the scientific background validating the efficacy of the products; methods for assessment of potential candidates for participation; the selection of appropriate measures for testing and evaluation; effective implementation techniques; approaches for using Progress Tracker reports to monitor student performance; and techniques for measuring the gains students have achieved after they have finished using Fast ForWord products.

Materials

The Fast ForWord products are computer-based products that combine an optimal learning environment with a focus on early reading and cognitive skills. The products include five to seven exercises designed to build skills critical for reading and learning, such as auditory processing, memory, attention, and language comprehension. While there are variations across products related to the specific skills targeted and the approaches taken, there are several critical skills developed in all of the products, as detailed in the following exercise descriptions.

Circus Sequence[1] *and Trog Walkers*[2]*:* Students hear a series of short, non-verbal tones. Each tone represents a different fragment of the frequency spectrum used in spoken language. Students are asked to differentiate between these tones. The exercises improve working memory, sound processing speed, and sequencing skills.

Old MacDonald's Flying Farm[1]*:* Students hear a single syllable that is repeated several times, and then interrupted by a different syllable. They must respond when they hear a change in the syllable. This exercise improves auditory processing, develops phoneme discrimination, and increases sustained and focused attention.

Phoneme Identification[1]*, Polar Cop*[2]*, and Treasure in the Tomb*[2]*:* Students hear a target phoneme, and then must identify the identical phoneme when it is presented later. These exercises improve auditory discrimination skills, increase sound processing speed, improve working memory, and help students identify a specific phoneme. *Polar Cop* also develops sound-letter correspondence skills. *Treasure in the Tomb* also develops grapheme recognition.

Phonic Match[1] *and Bug Out*[2]*:* Students choose a square on a grid and hear a sound or word. Each sound or word has a match somewhere within the grid. The goal is to find each square's match and clear the grid. The *Phonic Match* exercise develops auditory word recognition and phoneme discrimination, improves working memory, and increases sound processing speed. The *Bug Out!* exercise develops skill with sound-letter correspondences as well as working memory.

Phonic Words[1]*:* Students see two pictures representing words that differ only by the initial or final consonant (e.g., "face" versus "vase", or "tack" versus "tag"). When students hear one of the words, they must click the picture that matches the word. This exercise increases sound processing speed, improves auditory recognition of phonemes and words, and helps students gain an understanding of word meaning.

Language Comprehension Builder[1]*:* Students listen to a sentence that depicts action and complex relational themes. Students must match a picture representation with the sentence they just heard. This exercise develops oral language and listening comprehension, improves understanding of syntax and morphology, and improves rate of auditory processing.

Block Commander[1]*:* In *Block Commander*, a three-dimensional board is filled with familiar shapes that students select and manipulate. The students are asked to follow increasingly complex commands. This exercise increases listening comprehension, improves syntax, develops working memory, improves sound processing speed, and increases the ability to follow directions.

Start-Up Stories[2]: Students follow increasingly complex commands, match pictures to sentences, and answer multiple-choice questions about stories that are presented aurally.

Assessments

All students were evaluated with the Ohio Achievement Test (OAT) or the Ohio Proficiency Test (OPT) in October 2003, before Fast ForWord use, and then again in March of 2004. Third graders in Ohio are assessed with the Ohio Achievement Test, a test of reading ability. Fourth grade students are evaluated with the OPT. The OAT and the reading portion of the OPT were used for analysis in this study.

Ohio Achievement Test (OAT): The OAT for third grade students is designed to measure four of the five standards in Ohio's Grade 3 Academic Content Standards for Reading: Acquisition of Vocabulary, Reading Process, Reading Applications: Informational Text, and Reading Application: Literary Text.

[1] Exercise from the Fast ForWord Language product.
[2] Exercise from the Fast ForWord Language to Reading product.

Ohio Proficiency Test (OPT): The OPT tests are criterion-referenced, and compare the performance of the students to Ohio's selected curriculum in five areas: reading, math, citizenship, science, and writing. Test items include multiple choice, short answer, and extended response style questions.

Scores on the OAT and OPT are reported in terms of scale scores. The Ohio State Board of Education has established performance standards (cut scores) based on these scores. These standards divide test scores into performance levels ranging from Limited/Below Basic to Advanced. The established proficiency standard (performance level for Proficient) for the Ohio Achievement Test for 3rd graders is a scale score of 400. The proficiency standard for Reading for 4th grade students is a scale score of 217.

Analysis

Scores were reported in terms of scale scores. Data were analyzed using t-tests. All analyses used a p-value of less than 0.05 as the criterion for identifying statistical significance.

RESULTS

Participation Level

Research conducted by Scientific Learning shows a relationship between product use and the benefits of the product. Product use is composed of content completed, days of use, and adherence to the chosen protocol (participation level). During the 2003 – 2004 school year, the Oregon City School District chose to use a combination of the 75- and 100-Minute Fast ForWord Language Protocol and the 50- and 90-Minute Fast ForWord Language to Reading Protocols. These protocols call for students to use the products for 50, 75, 90 or 100 minutes a day, five days per week for four to twelve weeks. All 36 students used the Fast ForWord Language product; four students also used the Fast ForWord Language to Reading product. On average, students used the Fast ForWord Language product for 30 days, completing 65% of the product content. Detailed product use by product is shown in Table 1.

Figures 1 and 2 show the average daily progress through the Fast ForWord Language and Fast ForWord Language to Reading product exercises for students who had scores available for analysis. The final day shown is determined by the maximum number of days that at least two-thirds of the students participated. For students who used the product fewer than the number of days shown, percent complete is maintained at the level achieved on their final day of product use.

	Number of Students	Days Participated	Number of Calendar Days	Percent Complete	Participation Level
Fast ForWord Language	36	30	70	65%	49%
Fast ForWord Language to Reading	4	na	na	na	na

Table 1. Usage data showing the number of students who used each Fast ForWord product along with group averages for the number of days participated, the number of calendar days between start and finish, the percentage of product completed and the participation level. Due to the low number of students who used the Fast ForWord Language to Reading product, the group averages for this product are not shown.

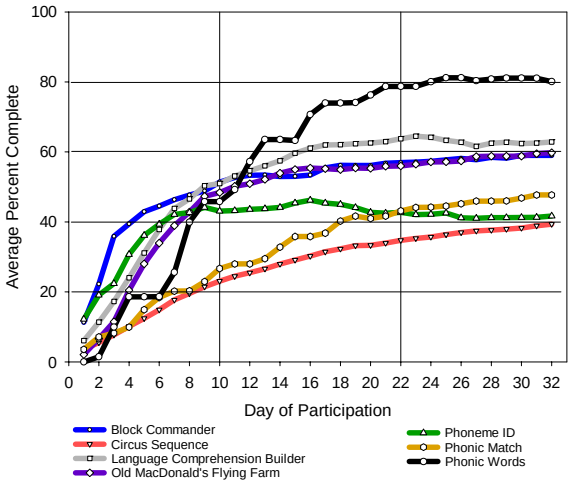

Figure 1. Average daily progress through the Fast ForWord Language product exercises. Results from 36 students are shown.

Assessment Results

The OAT and OPT were used to evaluate the reading achievement of students before and after Fast ForWord use. Students were assessed in October of 2003 and again five months later in March of 2004.

Ohio Achievement Test (OAT): Before Fast ForWord participation, all of the third graders in the study were below proficiency with an average OAT score of 373 (proficiency requires a score of 400). After using the Fast ForWord products, students, overall, made significant improvements, with an average increase of 18 points (Figure 2; Table 2). Overall, after Fast ForWord use, two-thirds of the students improved at least one performance level and one-third of the students improved enough to meet standards—achieving a level of Proficient or better (Table 3).

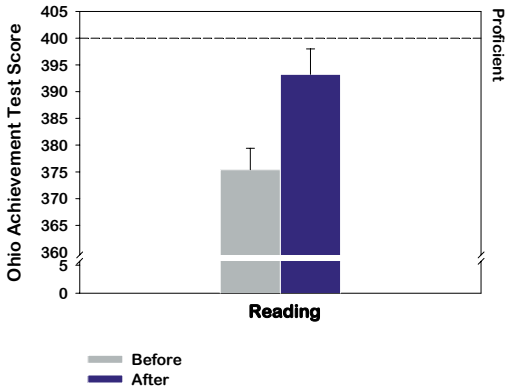

Figure 2. After using the Fast ForWord products, third grade students, on average, made significant gains in reading achievement on the OAT. Results from 12 students are shown.

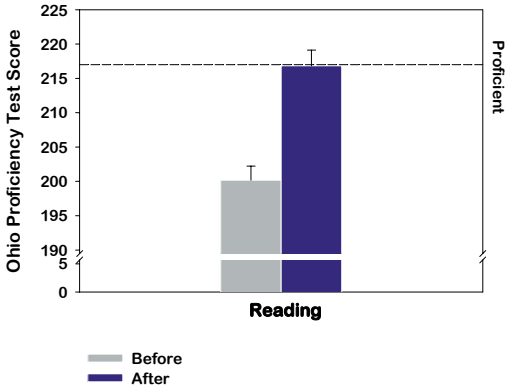

Figure 3. On average, fourth graders made significant improvements in reading achievement on the OPT after Fast ForWord participation. Results from 24 students are shown.

Ohio Proficiency Test (OPT): Before Fast ForWord use, only 4% (1) of the fourth graders in this study were meeting testing standards on the OPT. After Fast ForWord participation, students, on average, made significant gains and increased 16 points on the OPT; seventy percent improved at least one performance level and 54% reached a level of Proficient (Figure 3; Table 4).

		Before		After		
	n	Mean	SE	Mean	SE	t-statistic
3rd Grade	12	375.4	4.0	393.2	4.7	3.7*
4th Grade	24	200.7	2.0	216.8	2.2	5.7*

*Table 2. On average, students who used the Fast ForWord products made significant improvements in reading achievement on the OAT and OPT. *p<0.05.*

3rd Graders	Performance Level				
	Limited	Basic	Proficient	Accelerated	Advanced
Before Fast ForWord	7	5	0	0	0
After Fast ForWord	3	5	2	2	0

Table 3. Third grade performance levels on the Ohio Achievement Test before and after Fast ForWord use. A third of the students reached a performance level of proficient or better after Fast ForWord participation.

4th Graders	Performance Level			
	Below Basic	Basic	Proficient	Advanced
Before Fast ForWord	6	17	1	0
After Fast ForWord	1	10	13	0

Table 4. Fourth grade performance levels on the OPT before and after Fast ForWord use. Over half of the students were meeting Ohio's proficiency standards after participation
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DISCUSSION

To improve reading achievement, Fast ForWord products are used within the Oregon City School District along with other initiatives put forth by the district including, for example, Study Island, SuccesMaker, and curriculum alignment. During the 2003 – 2004 school year, 36 third and fourth grade students in the Oregon City School District used the Fast ForWord products and are included in this study. All but one of the students were not meeting Ohio's proficiency standards in reading before Fast ForWord use. On average, after participation, students made significant improvements in reading achievement and 69% increased at least one performance level; forty-seven percent of all students reached a performance level of Proficient or higher. These findings demonstrate that, within the Oregon City School District, an optimal learning environment coupled with a focus on cognitive and early reading skills can help students attain a higher level of reading achievement.

CONCLUSION

Language and reading skills are critical for all students, impacting their ability to benefit from instruction, follow directions, and participate in class discussions. Strong linguistic skills also provide a critical foundation for building reading and writing skills. After Fast ForWord use, students in the study

in the Oregon City School District made significant gains in their reading achievement. This suggests that using the Fast ForWord products strengthened the students' foundational skills and helped them benefit more from the classroom curriculum.

Notes:

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