Improved Reading Achievement by Students in the Miami-Dade County Public Schools who used Fast ForWord® Products

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 single school case study using state achievement tests. **Subjects:** Study participants were repeating the 3rd grade and attending Madie Ives Elementary School in the Miami-Dade County Public Schools of Miami, Florida. **Methods & Implementation:** Before and after participation in the Fast ForWord products, student performance was evaluated with the Florida Comprehensive Assessment Test (FCAT). **Results:** On average, a group of students who were struggling readers made significant improvements in reading achievement, with 93% of the students improving their Florida Comprehensive Assessment Test Reading Scale Score and 54% of the students improving their FCAT Reading Level by two or more levels. The group moved their reading achievement towards the state average after using the Fast ForWord products.

Keywords: Florida, public, elementary school, urban district, observational study, Fast ForWord Language, Fast ForWord Language to Reading, Florida Comprehensive Assessment Test (FCAT).

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 Miami-Dade County Public Schools were interested in evaluating the effectiveness of this approach as a way for improving the reading curriculum and instruction for their students. 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 who were academically struggling.

METHODS

Participants

The Miami-Dade County Public Schools form a pre-Kindergarten to 12th grade urban school district serving over 350,000 students. Madie Ives Elementary School, one of the 370 schools in the district, took part in this study. Madie Ives serves over 1,100 students in grades K-5. Sixty-one percent of students are African-American and 26% are Hispanic. Approximately 73% receive free or reduced price lunches.

During the 2003-2004 school year, 169 students in the second to fifth grades used the Fast ForWord products; the majority of the students were in the second or third grades. Students were chosen to use the products if they were 1) Retained in the third grade; 2) Level 1 Readers (as determined by the state assessment); or 3) identified by their teachers as at-risk for academic failure.

Following the 2002 – 2003 school year, twenty-eight third graders were retained and were assigned to use Fast ForWord products during the 2003 – 2004 school year. Data from these 28 students are reported in this study.

The reading skills of these students were evaluated on the Florida Comprehensive Assessment Test (FCAT)

in Spring, 2003 (before the use of the Fast ForWord products) and in Spring, 2004 (after the use of the Fast ForWord products). School personnel administered the assessments and reported scores for analysis. This report is about the 28 third graders with the two assessments.

Implementation
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.

Prior to a student becoming a Fast ForWord participant, the student's parents are contacted, and permission sought. The student's parents and teachers are asked to fill in behavioral questionnaires. The students then use the Fast ForWord Language 100-Minute Protocol and the Fast ForWord Language to Reading 90-Minute Protocol in a computer lab during one of three daily sessions. Two paraprofessionals monitor the students, reviewing student progress through the product twice each week. Weekly meetings with the students help the students maintain their focus on progress through the product. Weekly reports are reviewed by the school's administrative team. The lab walls are covered with posters showing student progress, and student progress is frequently rewarded with incentives.

Materials
The Fast ForWord Language and Fast ForWord Language to Reading 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 differences between the products, both help develop certain critical skills 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,

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

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

In the spring of 2003 and spring of 2004 (before and after using the Fast ForWord products) students' reading skills were evaluated with the reading portion of the Florida Comprehensive Assessment Test (FCAT). School personnel administered the assessment, and reported the scores for analysis.

Florida Comprehensive Assessment Test (FCAT): The reading portion of the FCAT is designed to assess student achievement of the high-order cognitive skills represented in the Sunshine State Standards (SSS) for Reading. This is a criterion-referenced test. All students in Grades 3-10 take the FCAT in Reading and Mathematics in the spring of each year. The primary metric for reporting student performance on the FCAT is the Scale Score. FCAT Scale Scores are designed to remain roughly the same from year to year for the student who maintains steady progress, neither overtaking nor falling behind his or her peers.

Analysis

Data was analyzed using a repeated measure multivariate analysis of variance (MANOVA) and dependent 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 Madie Ives Elementary School used the 100-Minute Fast ForWord Language Protocol and the 90-Minute Fast ForWord Language to Reading protocol which call for students to use the products for 90- or 100-minutes a day, 5 days a week, for four to eight weeks.

Twenty-eight third graders from Madie Ives Elementary School used the Fast ForWord products during the 2003 – 2004 school year and were assessed on the reading portion of the FCAT in 2003 and 2004. All 28 students used both the Fast ForWord Language product and the Fast ForWord Language to Reading product. On average, students completed 77% of the product content in a calendar period of 46 days and reached a participation level of 64%. The students then used the Fast ForWord Language to Reading product. Detailed usage information by product is shown in Table 1.

	Number of Students	Average Days	Average Calendar Days	Average Percent Complete	Participation Level
Fast ForWord Language	28	28	46	77%	74%
Fast ForWord Language to Reading	28	18	35	61%	64%

Table 1. Usage data showing the number of students who used each Fast ForWord product along with group averages for the number of days of use, the calendar days from start to finish, the percentage of product content completed and participation level.

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

Assessment Results

Florida Comprehensive Assessment Test (FCAT): The FCAT was used to evaluate the reading achievement of students before and after participation

on the Fast ForWord products. Scores were reported in terms of a scale scores which can be converted to Levels. Before participation, the students were third grade Level 1 Readers. All were retained in the third grade, and used Fast ForWord products.

Following participation, FCAT Reading scale scores were again reported for all study students. Of the 28 students, 26 of them (93%) increased their scale score between 2003 and 2004. A dependent t-test showed that, after using the Fast ForWord products, the students made statistically significant improvements (Table 2),

with the group's mean scale score increasing from 213 to 276. Figure 3 shows the mean gain of students in the study.

On the FCAT, students are divided into levels 1 – 5. All students in this report were at level 1 in 2003. Level 1 corresponds to: student has little success with the challenging content of the Sunshine State Standards. In 2004, 15 of the students (54%) had moved up to level 3 or above (Figure 4). Of the 11 students who remained at Level 1, all but two improved their scale score – a more sensitive measure.
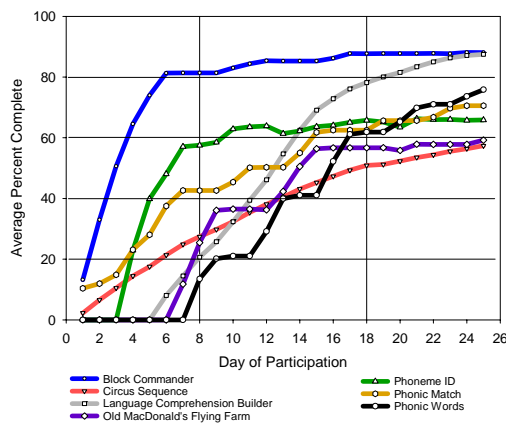

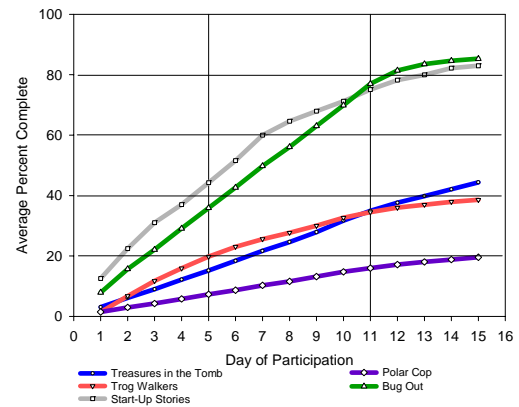*Figure 1. Average daily progress through the Fast ForWord Language product. Results from 28 students are shown.*

Figure 2. Average daily progress of students through the anguage to Reading product. Results from 28 students are shown.

FCAT Reading		2002 (Before)		2003 (After)		
	n	Mean	SE	Mean	SE	t-value
Scale Score	28	212.8	8.7	276.2	11.6	-7.2*

*Table 2. Overall, 28 elementary school students who used the Fast ForWord Language and Fast ForWord Language to Reading products made statistically significant gains in reading, as measured by the reading portion of the FCAT. *p < 0.05.*

Number of Students at Each Level on the FCAT Reading					
	Level 1	Level 2	Level 3	Level 4	Level 5
2003	28	0	0	0	0
2004	11	2	9	6	0

Figure 4. The percentage of students at each level on the FCAT Reading Test before and after Fast ForWord participation: all students were Level 1 Readers before participation. After participation, the majority of students had progressed to more advanced levels.

DISCUSSION

During the 2003 – 2004 school year, third graders at Madie Ives Elementary School who were in this study used the Fast ForWord products for an average of 46 days. Academically, the students were very low performing – all had been retained. They had a mean

FCAT Reading score of 213. After Fast ForWord participation, the students had a mean scale score of 276, approaching the average FCAT Reading scale score for third graders in the Miami-Dade County Public Schools (288).

These findings demonstrate that, within Madie Ives Elementary School in the Miami-Dade County Public Schools, an optimal learning environment coupled with a focus on cognitive and early reading skills can help students attain a higher level of academic achievement.
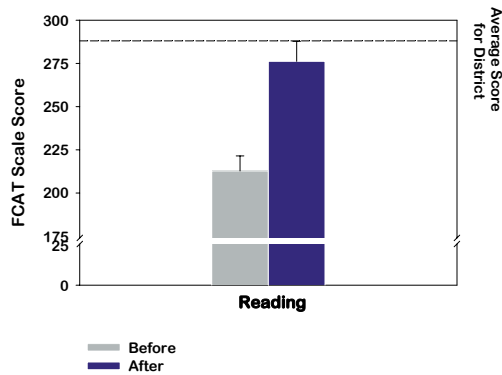

Figure 3. Average FCAT scores for 28 students in the third grade prior to Fast ForWord participation, and then again following Fast ForWord participation.

It should be noted that the academic success achieved by students at Madie Ives elementary school was, in part, a reflection of the successful implementation. Staff at Madie Ives gave their full support to the products and the students using them.

CONCLUSION

Receptive and expressive language skills are critical for all students, impacting their ability to benefit from the curriculum, follow instructions, and participate in class discussions. Strong linguistic skills also provide a critical foundation for building reading and writing skills. After using the Fast ForWord products, students improved their reading and language abilities as measured by the reading portion of the FCAT. This suggests that using the Fast ForWord products strengthened the students' foundational skills and helped them benefit more from the classroom instruction

Notes:

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