

Improved Oral Language Skills by Students in the Weymouth Public Schools who used Fast ForWord® Products

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ABSTRACT

Purpose: This study investigated the effects of the Fast ForWord products on the oral language skills of 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 a nationally normed test. **Participants:** Study participants were 16 students attending a six-week summer school at the Thomas Nash Primary School in the Weymouth Public Schools in Weymouth, Massachusetts. **Materials & Implementation:** Following staff training on the Fast ForWord products, a group of students used the products during the summer of 2004. Before and after Fast ForWord participation, student performance was evaluated with the Clinical Evaluation of Language Fundamentals – 4th edition, an assessment of oral language skills. **Results:** On average, students made significant improvements in their oral language skills after participation on the Fast ForWord products with total language skills improving nearly one-third of a standard deviation.

Keywords: Massachusetts, public elementary school, suburban district, observational study, special education, Fast ForWord Language, Clinical Evaluation of Language Fundamentals – 4th edition (CELF-4).

INTRODUCTION

Numerous research studies have shown that cognitive and oral language skills are underdeveloped 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 Weymouth Public Schools were 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 oral language skills of students in a summer 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 oral language skills of the students.

METHODS

Participants

The Weymouth Public Schools, located in Weymouth, Massachusetts, 16 miles south of Boston, is a suburban district with 13 campuses serving nearly 7,000 students in Kindergarten through twelfth grade. This study took place in one of the elementary schools: Thomas Nash Primary School.

In 2004, Weymouth Public Schools held a six-week summer school program at Thomas Nash Primary School. Students in the program used Fast ForWord products and took part in the study reported here. Most of the students in the study were receiving special education services at primary and intermediate schools throughout the district. Challenges students faced ranged from developmental delays to learning disabilities, to reading and/or language difficulties.

Students had their language and early reading skills evaluated with the Clinical Evaluation of Language Fundamentals – fourth edition (CELF-4). Sixteen students had assessment scores available for

analysis. The students were in the 1st through 8th grades. School personnel administered the assessments and reported scores for analysis.

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.

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, all help develop certain critical skills as detailed in the following exercise descriptions.

Circus Sequence¹ and Trog Walkers²: 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 Farm¹: 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 Identification¹, Polar Cop², and Treasure in the Tomb²: 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 Match¹ and Bug Out²: 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 Words¹: 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 Builder¹: 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 Commander¹: 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 Stories²: Students follow increasingly complex commands, match pictures to sentences, and answer multiple-choice questions about stories that are presented aurally.

Assessments

Students throughout the district had their early reading and language skills assessed by district

¹ Exercise from the Fast ForWord Language product.

² Exercise from the Fast ForWord Language to Reading product.

personnel with the Clinical Evaluation of Language Fundamentals (CELF-4).

Clinical Evaluation of Language Fundamentals-4 (CELF-4): The CELF-4 is a comprehensive language test widely used to measure a student’s overall oral language ability. It has receptive and expressive components. The subtests that comprise the receptive and expressive components of the CELF-4 vary by age, and can be combined to give the overall oral language score.

On the CELF-4, standard scores have a mean of 100 and a standard deviation of 15 (in this metric, scores from 85 to 115 are within the normal range). They are age-normed such that a change in standard score indicates a change in the student’s performance relative his or her peers.

Analysis

Data were analyzed using a dependent t-test. The analysis 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).

The Weymouth Public Schools chose to use the Fast ForWord Language 100-Minute Protocol. This protocol calls for students to use the products for 100-minutes per day, five days a week for four to eight weeks. All students in the study used the Fast ForWord Language product; five students also used the 90-Minute Protocol of the Fast ForWord Language to Reading product which calls for students to use the product for 90 minutes per day, five days a week for four to eight weeks. Detailed usage information by product is shown in Table 1 for the fifteen students included in the analysis.

Figures 1 - 2 show the average daily progress through the Fast ForWord product exercises for all students who had 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.

	Number of Students	Days Participated	Number of Calendar Days	Percent Complete	Participation Level
Fast ForWord Language	15	23	34	66%	92%*
Fast ForWord Language to Reading	5	12	16	50%	98%

Table 1. Usage data showing the number of students who used each product along with group averages for the number of days of product use, calendar days between start and finish, the percentage of content completed and participation level. *Participation Level was not available for three students.

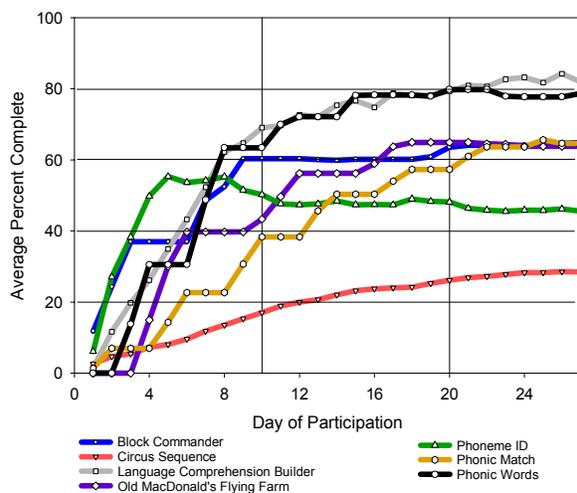


Figure 1. Average daily progress of students through the Fast ForWord Language exercises. Results from 15 students are shown.

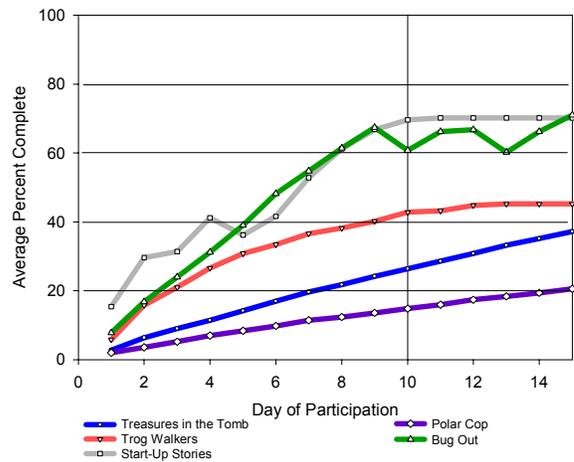


Figure 2. Average daily progress of students through the Fast ForWord Language to Reading exercises. Results from 5 students are shown.

Assessment Results

Clinical Evaluation of Language Fundamentals (CELF-4): Student data from before and after participation were reported in terms of standard scores for the sixteen students. Scores from one student were not included in the analysis due to anxiety and attentional problems affecting the ability to accurately assess the student's language and early reading skills.

Standard scores are normed relative to a student's age. Therefore, changes in standard scores indicate

that the performance of the student, or group of students, is changing relative to their peers.

Before participation on the Fast ForWord products, students, on average, were performing in the low average range on their oral language skills. After Fast ForWord participation, the students made significant improvements, moving higher within the average range (Figure 3, Table 2).

	n	Before		After		t-statistic
		Mean	SE	Mean	SE	
CELF-4	15	85.4	4.5	89.7	4.3	2.5*

Table 2. Students, on average, significantly improved their oral language skills after Fast ForWord use. * $p < 0.05$.

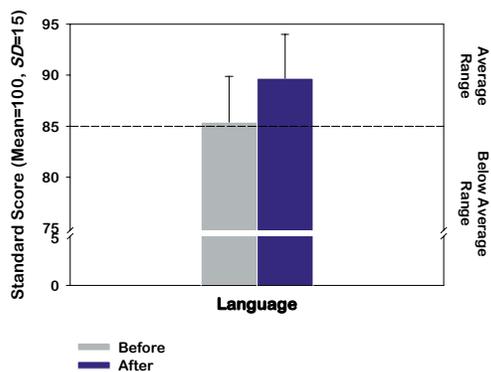


Figure 3. On average, 15 students who used the Fast ForWord products made significant improvements in their oral language skills.

DISCUSSION

All of the students in this summer school study were struggling with language and/or reading challenges. Before participation, the students, as a group, were at the lower edge of the average range with some of the students well below the average range, and some of the students solidly within the average range. On average, they were around the 16th percentile. Improvement varied across the students with some students achieving dramatic improvements in their oral language skills, and other students demonstrating less benefit. After participation, the average standard score corresponded to the 24th percentile.

The improvements measured by the CELF-4 tell only one part of the story. The other parts are reported by the teachers and families of the students. For example, the student who had regular meetings

with a speech and language therapist, but with limited improvement, began to rapidly gain new language skills. Her parents had previously acted as interpreters, repeating questions for her, but after using Fast ForWord products, she was able to interact with her cousins at a large family gathering without assistance.

CONCLUSION

Strong reading and language 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 using the Fast ForWord products, the group of students in this study demonstrated significant improvements in their oral language skills with their performance moving higher into the average range. This suggests that using the Fast ForWord products strengthened the students' foundational skills and will help them benefit more from the classroom curriculum.

Notes:

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