

Improved Language and Early Reading Skills by Students in School District 54 in Schaumburg, Illinois, who used Fast ForWord[®] Language

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ABSTRACT

Purpose: This study investigated the effects of the Fast ForWord Language product on the language skills of children when used within the curriculum in a school setting. **Study Design:** The design of the study was a single-school case study using nationally normed tests. Analysis of variance (ANOVA) procedures and dependent t-tests were used to evaluate changes in student test performance. **Participants:** Study participants were 105 students, ranging in age from 4 to 14, who were attending schools in School District 54 in Schaumburg, Illinois. **Materials & Implementation:** Following staff training on the Fast ForWord Language product, 105 students in School District 54 used the Fast ForWord Language product for an average of 37 days over an average period of 59 calendar days. To evaluate performance, student skills were measured with the Clinical Evaluation of Language Fundamentals, Third Edition (CELF-3) before and after use of the Fast ForWord Language product and again 6 – 12 months later. **Results:** The ANOVA and post hoc analyses indicated that there were significant improvements in standard scores for both the Receptive and Expressive Language composites of the CELF-3, and these improvements were maintained.

Keywords: Illinois, elementary schools, middle schools, suburban district, observational study, ELL, special education, Fast ForWord Language, Clinical Evaluation of Language Fundamentals, Third Edition (CELF-3).

INTRODUCTION

Early laboratory tests of a prototype of a computer-based product combined an optimal learning environment with a focus on early reading and cognitive skills. The results were dramatic improvements in the auditory processing and language skills of elementary school children who had specific language impairments (Merzenich et al., 1996; Tallal et al., 1996) or were at-risk for academic failure (Miller et al., 1999). The Schaumburg School District was interested in evaluating the effectiveness of this approach for improving their curriculum and instruction for elementary and middle school students with special needs. In this study, a commercially available computer-based product (Fast ForWord Language) was used to evaluate the effectiveness of this approach for improving the oral language skills of children.

METHODS

Participants

During the Spring and Fall of 1998, 105 students in School District 54 in Schaumburg, Illinois, used the Fast ForWord Language product. The students participating in this study ranged from 4 to 14 years of age, and had been referred for speech/language services by teachers or administrators. Participants included students receiving Special Education services and students who were non-native English speakers.

Implementation

Educators at School District 54 were trained in current and established findings on the neuroscience of 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 candidates for participation; the selection of appropriate measures for testing and evaluation; effective implementation techniques; approaches for monitoring student performance; and techniques for measuring the gains students have achieved after they have finished using the product.

Materials

All of the study participants used the Fast ForWord Language product, a computer-based product that combines an optimal learning environment with a focus on early reading and cognitive skills. The product includes seven exercises designed to build skills critical for reading and learning, such as auditory processing, memory, attention, and language comprehension.

Circus Sequence: 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. This exercise

improves working memory, sound processing speed, and sequencing skills.

Old MacDonald's Flying Farm: Students use the computer mouse to catch and hold a flying animal. The animal repeats a single syllable several times, and students must release the animal when they hear a change in the syllable. This exercise improves auditory processing, develops phoneme discrimination, and increases sustained and focused attention.

Phoneme Identification: First, students listen as one animal character utters a phoneme, and then two new animals utter similar phonemes. The students identify which of the latter two sounds was identical to the first phoneme. This exercise improves auditory discrimination skills, increases sound processing speed, improves working memory, and helps students identify specific phonemes.

Phonic Match: 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. This exercise develops auditory word recognition and phoneme discrimination, improves working memory, and improves rate of auditory processing.

Phonic Words: Students see two pictures representing two similar words that differ only by initial or final consonant ("tack" versus "tag"). When students hear the word representing one of the pictures, 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: 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: In Block Commander, a three-dimensional board game is filled with familiar shapes that students select and manipulate. The students are asked to follow increasingly complex commands. This exercise increases listening comprehension and the ability to follow directions, improves syntax, develops working memory, and improves sound processing speed.

Assessments

The students' language skills were assessed using the Clinical Evaluation of Language Fundamentals, Third

Edition (CELF-3) before and after they used the Fast ForWord product. Their skills were evaluated a third time, six to twelve months after product completion. School personnel administered the assessment, and reported both standard scores and age-equivalents for analysis.

The CELF-3 is a comprehensive language test widely used to measure a child's ability to understand words and sentences, follow directions, recall and formulate sentences, and understand relationships between words and categories. The Institute for the Development of Educational Achievement, in accordance with the Reading First legislation, determined that the CELF-3 subtests listed in Table 1 are appropriate outcome assessments for accurately measuring improvement in the vocabulary skills of children in early elementary school. As defined by the Reading First legislation, vocabulary skills are an essential component of early reading. Two of the subtests, Concepts and Directions and Recalling Sentences, also measure memory.

On the CELF-3, standard scores for composites have a mean of 100 and a standard deviation of 15 (in this metric, scores from 85 to 115 are within the normal range); for subtests, standard scores have a mean of 10, and a standard deviation of 3.

Performance on the CELF-3 can be reported in terms of individual subtests or as two composite scores: the *Receptive Language Score*, and the *Expressive Language Score*. Alternatively, these two composites can be combined to yield the *Total Language Score*.

| CELF-3 Subtest | Description of Subtest |
|-------------------------|--|
| Concepts and Directions | a receptive language assessment that tests the student's ability to interpret and execute commands of increasing complexity |
| Recalling Sentences | an expressive language assessment that tests the student's ability to remember and reproduce sentences of increasing length and difficulty |
| Word Classes | a receptive language assessment that tests the student's ability to understand relationships between words and categories |

Table 1. Receptive language subtests from the CELF-3 are recognized by the Institute for the Development of Educational Achievement as appropriate assessments for measuring early reading skills, specifically vocabulary.

Analysis

Standard scores were used for all analyses. Age-equivalents were used only for descriptive purposes. Student scores were compared using an analysis of variance (ANOVA) with two within-subjects factors (time x composite), to determine whether the Receptive Language Score and the Expressive Language Score were differentially affected. Post hoc analyses were performed to compare before and after scores for each composite. All analyses used a p-value of 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 protocol used by School District #54 called for students to use the Fast ForWord Language product for 100 minutes a day, five days a week, for four to eight weeks. During the

spring and fall of 1998, 105 students in School District 54 used the Fast ForWord Language product. On average, these students used the product for 37 days over period of 59 calendar days, achieving an average participation level of 83% and completing an average of 69% of the product content (Table 2).

| | Number of Students | Average Days of Product Use | Average Number of Calendar Days | Average Participation Level | Average Overall Percent Complete |
|-------------|--------------------|-----------------------------|---------------------------------|-----------------------------|----------------------------------|
| Overall | 105 | 37 | 59 | 83% | 69% |
| Spring 1998 | 37 | 42 | 70 | 79% | 63% |
| Fall 1998 | 68 | 34 | 53 | 85% | 72% |

Table 2. Usage data showing the number of students who used the Fast ForWord product in the spring and fall of 1998 along with group averages for the number of days of use, calendar days between start and finish, percentage of content covered, and participation level.

Assessment Results

Clinical Evaluation of Language Fundamentals – Third Edition:

CELF-3 standard scores for Receptive Language, Expressive Language, and Total Language were reported for all study students. Before participation in the Fast ForWord Language product, on average, students were in the below average range on Receptive, Expressive and Total Language. Following the Fast ForWord Language product participation, on average, the students made significant improvements in all three Composite Scores. Six months to one year following their Fast ForWord Language participation, on average, students maintained their significant

improvements on all three Composite Scores (Figure 1).

Student scores are also reported for specific subtests: Concepts and Directions, Recalling Sentences, and Word Classes. On average, students were in the below average range in Concepts and Directions and Recalling Sentences and in the average range in Word Classes. Following Fast ForWord Language participation, students made significant improvements in Concepts and Directions and Recalling Sentences. Six months to a year following Fast ForWord Language participation, students maintained their improvements in Concepts and Directions and Recalling Sentences (Figure 2).

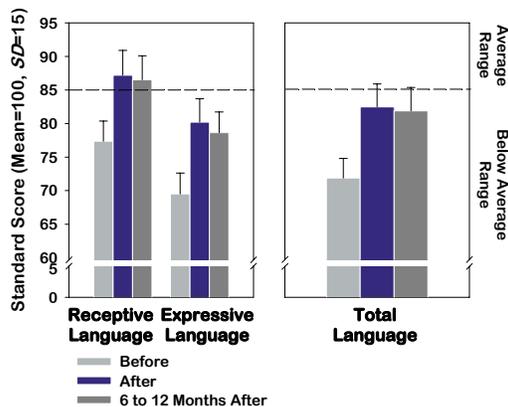


Figure 1. Improvements in Language Abilities: average Composite Scores of Schaumburg students before, after, and six months to one year following their Fast ForWord participation.

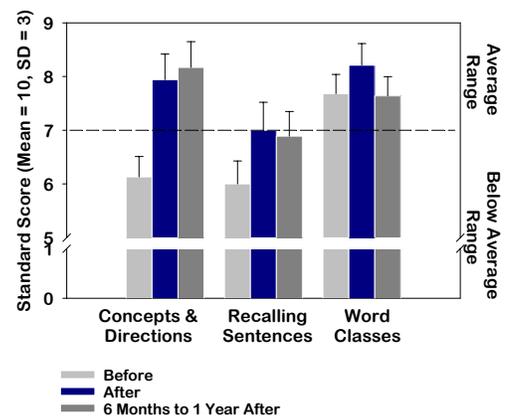


Figure 2. Improvements in Early Reading Skills: average subtest scores of Schaumburg students before, after, and six months to one year following their Fast ForWord participation.

DISCUSSION

Before using the Fast ForWord Language product, students were in the below average range for both language and early reading abilities. Following participation and six months to a year after using the Fast ForWord Language product, students made significant improvements in language and early reading abilities.

CONCLUSION

Receptive and expressive language skills are critical for all students, impacting their ability to benefit from instruction, follow instructions, and participate in class discussions. Strong linguistic skills also provide a critical foundation for building reading and writing skills. On average, the students who participated in this study made significant gains on both the Receptive and Expressive Language composites of the CELF-3. These findings demonstrate that, at Schaumburg, an optimal learning environment coupled with a focus on cognitive skills and the linguistic foundations of reading can help students make significant improvements in language skills.

Notes:

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