Improved Reading Skills by Students in the Franklin Regional School District who used Fast ForWord® Products

MAPS for Learning: Educator Reports 10(29): 1-5

ABSTRACT

Purpose: This study investigated the effects of the Fast ForWord products on the reading 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 study using nationally normed tests. **Participants:** Study participants were elementary school students enrolled in summer school in the Franklin Regional School District in Murrysville, Pennsylvania. Half of the students were receiving services for special education. **Materials & Implementation:** Students were evaluated with the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) before and after participation on the Fast ForWord products. **Results:** Students, on average, made significant improvements in reading skills after using the Fast ForWord Language product. Students improved reading fluency by 10%, moving from the "at-risk" level to the "some risk" level.

Keywords: Pennsylvania, elementary school, suburban, observational study, special education, Fast ForWord Language, Dynamic Indicators of Basic Early Literacy Skills (DIBELS).

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 Franklin Regional 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 to improve reading skills of students in a school setting. In this study, a commercially available computer-based product (Fast ForWord Language) was used to evaluate the effectiveness of this approach at improving the reading skills of students.

METHODS

Participants

Franklin Regional School District is located in Murrysville, Pennsylvania, roughly 20 miles east of Pittsburgh. The district serves nearly 4,000 students from Murrysville and the nearby towns of Delmont and Export. The district houses one high school, one middle school and three elementary schools, each of which serves a predominantly Caucasian student body.

This report focuses on twenty-six first through sixth grade students from the elementary schools who used the Fast ForWord Language product during the summer of 2006. Seven students were classified as having Specific Learning Disability, four with Specific Language Impairment, three were diagnosed with Autism, and two were classified as having Other Health Impairments.

The students were assessed with the Oral Reading Fluency (ORF) subtest of the DIBELS in late May or early June of 2006, before beginning summer school. Students were evaluated again following the summer session, in July or August of 2006. 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 products are computer-based products that combine an optimal learning environment with a focus on early reading and cognitive skills. The product used in this study (Fast Language) includes seven exercises designed to build skills critical for reading and learning, such as auditory processing, memory, attention, and language comprehension.

Circus Sequence[12]*:* 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 exercise improves 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]*:* Students hear a target phoneme, and then must identify the identical phoneme when it is presented later. This exercise improves auditory discrimination skills, increases sound processing speed, improves working memory, and helps students identify a specific phoneme.

Phonic Match[1]*:* 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.

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.

Assessments
Before and after Fast ForWord participation, students were evaluated with Oral Reading Fluency (ORF) subtest of the Dynamic Indicators of Basic Early Literacy Skills (DIBELS). Four students also had scores available from the Phoneme Segmentation Fluency (PSF) and Nonsense Word Fluency (NWF) subtests. Pre-tests were administered in late May and early June of 2006 and post-tests were given towards the end of the summer school session, in July and August of 2006.

Dynamic Indicators of Basic Early Literacy Skills (DIBELS):
The DIBELS are standardized, individually administered measures of early literacy development designed to monitor the development of pre-reading and early reading skills. Skills assessed range from phonemic awareness to phonics to fluency. The appropriate skills for measuring with the DIBELS vary with the grade of the students. For students in the second grade and beyond, the appropriate measure is Oral Reading Fluency, which is a standardized test of accuracy and fluency.

The Institute for the Development of Educational Achievement, in accordance with the Reading First legislation, recognizes the DIBELS as an appropriate assessment for measuring improvement in the reading skills of children in early elementary school

[1] Exercise from the Fast ForWord Language product.

Analysis
Oral Reading Fluency scores were reported as raw scores reflecting words per minute. Data were analyzed using paired 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 and attendance level). During the summer of 2006, the Franklin Regional School District chose to use the 100-minute protocol for the Fast ForWord Language product. This protocol called for students to use the product for 100 minutes a day, five days per week for four to eight weeks. Detailed product use is shown in Table 1.
Figure 1 shows the average daily progress through the Fast ForWord Language 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	Attendance Level
Fast ForWord Language	26	31	51	85%	99%	79%

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, the participation level and the attendance level.

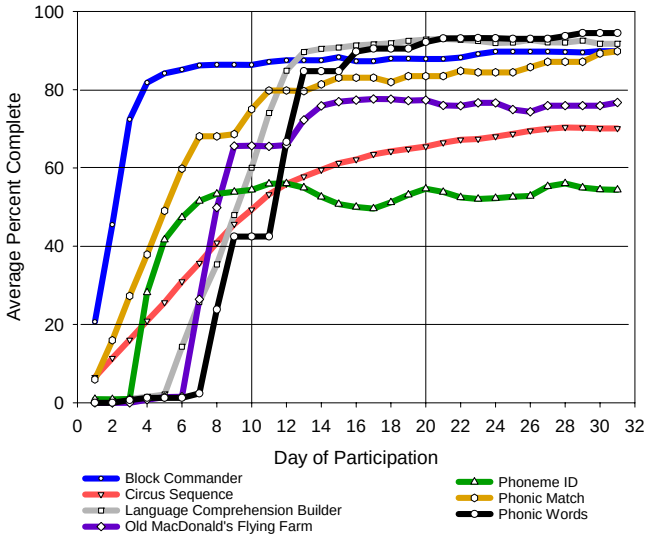

Figure 1. Average daily progress through the Fast ForWord Language product exercises. Results from 26 students are shown.

Assessment Results
Dynamic Indicators of Basic Early Literacy Skills (DIBELS): As a group, students made significant improvements in fluency after using the Fast ForWord Language product.

The benchmark goal for students' oral reading fluency varies by grade. A weighted average of the benchmark goal for students in the study was 108 words per minute. The cut-off between "at-risk" and "some risk" was 84 words per minute.

Before Fast ForWord participation, students were reading an average of 83 words per minute placing the group in the "at-risk" category. Students performed significantly better after Fast ForWord participation, with scores increasing 10% to 91 words per minute, and the group moving up a level to "some risk" -- making group progress towards the benchmark goal of 108. (Table 2, Figure 2).

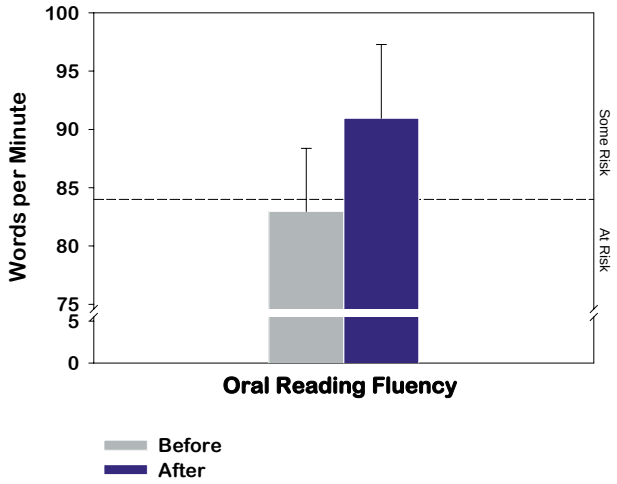

Figure 2. Twenty-six elementary school students significantly improved reading skills following Fast ForWord participation.

	n	Before		After		t-statistic
		Mean	SE	Mean	SE	
ORF	26	83	5.4	91	6.3	-3.38*

*Table 2. Students, on average, made significant improvements in reading fluency skills after Fast ForWord participation. *p<0.05.*

Four students who were given the first grade battery of DIBELS testing also had scores available from the Phoneme Segmentation Fluency and Nonsense Word Fluency subtests. Due to the small number of students, only descriptive results are presented (Table 3, Figures 3 & 4).

	n	Before	After
		Mean	Mean
Phoneme Segmentation Fluency	4	27	31
Nonsense Word Fluency	4	22	34

Table 3. Scores improved on the Phoneme Segmentation Fluency and Nonsense Word Fluency subtests following Fast ForWord participation.

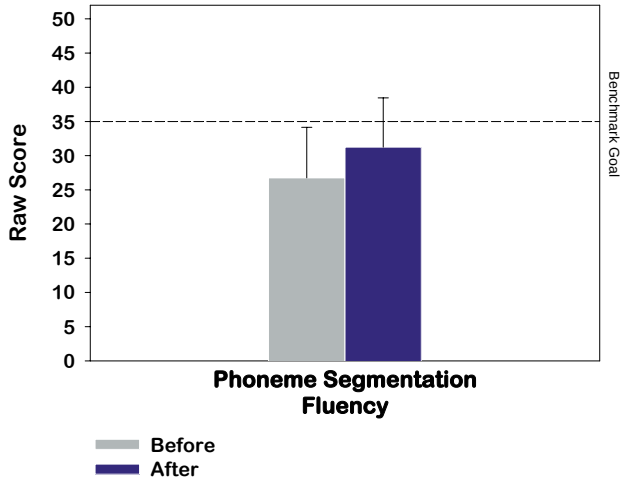

Figure 3. Four students improved Phoneme Segmentation Fluency skills after using Fast ForWord products.

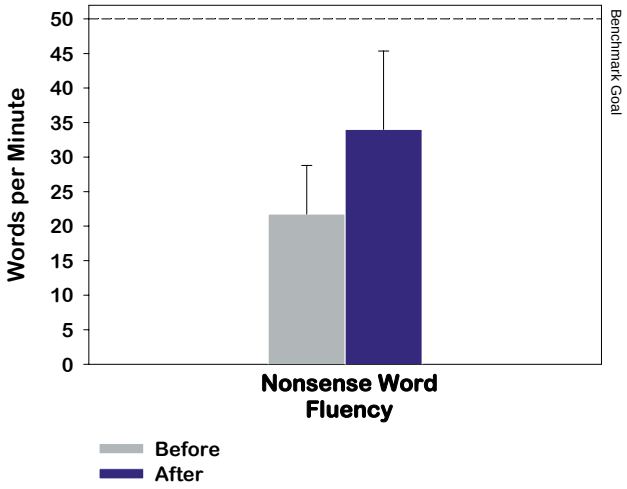

Figure 4. Scores on Nonsense Word Fluency increased after Fast ForWord participation. Results from 4 students are shown.

DISCUSSION

Twenty-six students used the Fast ForWord products during the summer of 2006. These students were performing below grade level and half of them were classified as having Autism, Specific Learning Disability, Specific Language Impairment, Other Health Impairments or a combination of these. After an average of 31 days of using the Fast ForWord Language product during summer school, students improved their oral reading fluency by 10%, moving into the "some risk" category, and approaching benchmark goals. These findings demonstrate that, within the Franklin Regional 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 Franklin Regional School District made significant gains in their reading performance as measured by the Oral Reading Fluency subtest of the DIBELS. This suggests that using the Fast ForWord products

strengthened the students' foundational skills and helped them benefit more from the classroom curriculum.

Notes:

To cite this report: Scientific Learning Corporation (2006). Improved Reading Skills by Students in the Franklin Regional School District who used Fast ForWord® Products, MAPS for Learning: Educator Reports, 10(29): 1-5.

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