

# Improved Reading Skills by Students who used Fast ForWord<sup>®</sup> to Reading 2

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## ABSTRACT

**Purpose:** This study investigated the effects of the Fast ForWord to Reading 2 product on the reading skills of elementary school students who used the product within the curriculum in a school setting. **Study Design:** The design of this study was a randomized control trial with students in a single school. Nationally normed tests were used to evaluate efficacy. **Participants:** Study participants were 50 third grade students attending an elementary school in a rural school district. Students were randomly assigned to one of two groups; half of the students used the Fast ForWord to Reading 2 product while the other half served as a comparison group and did not use the product. **Materials & Implementation:** Following staff training on the Fast ForWord to Reading 2 product, a group of students used the product in January of the 2004 – 2005 school year. Before and after Fast ForWord participation, student reading skills were evaluated with the Test of Word Reading Efficiency (TOWRE). **Results:** On average, students made significant improvements after Fast ForWord use, with the Fast ForWord participants significantly outperforming the comparison group and gaining over half a standard deviation in measures of reading fluency.

**Keywords:** Public elementary school, rural district, experimental study, randomized control group, Fast ForWord to Reading 2, Test of Word Reading Efficiency (TOWRE).

## 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 school district in this report was interested in evaluating the effectiveness of an optimal learning environment with a focus on early reading and cognitive skills as a way of improving the reading abilities of students in a school setting. In this study, a commercially available computer-based product (Fast ForWord to Reading 2) was used to evaluate the effectiveness of this approach at improving the reading skills of early elementary school students.

## METHODS

### Participants

During January of the 2004 – 2005 school year, 50 third grade students—from a total third grade class of 78 students—participated in this study. Participants included one entire classroom of students along with randomly selected students from the other third grade classrooms and all participants were eligible to be assigned to either group. Using computer-generated random numbers, half of the study participants were randomly assigned to the Fast ForWord group and used the Fast ForWord to Reading 2 product. The other half was assigned to a comparison group and took part in the regular school curriculum. The Fast ForWord group missed the social studies and science portions of the school curriculum during participation on the product. All participants had previously used other Fast ForWord products and were using Open Court Reading throughout the study as part of their regular school curriculum.

All students had their reading skills evaluated with the Test of Word Reading Efficiency (TOWRE) before and after the Fast ForWord group used the products. 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 to Reading 2 product is a computer-based product that combines an optimal learning environment with a focus on early reading and cognitive skills. The product includes six exercises designed to build skills critical for reading and learning, such as auditory processing, memory, attention, and language comprehension.

*Bear Bags: More Lunch:* In this exercise, the participant is asked to help Mama Bear sort words (on pieces of toast) into phoneme-based categories (in lunch bags). The exercise develops phonemic awareness along with grapheme/phoneme associations and decoding of single-syllable words.

*Magic Bird:* This exercise combines spelling and word-building practice with spelling patterns and word families commonly studied in 2nd grade. The task is designed to put an emphasis on word families and multiple letter spelling patterns. Using a click interface, the participant must select the missing onset or rime to complete a partially spelled word or must make as many real words as possible by pairing onsets and rimes from a grid. The bird magician does card tricks that present the participant with the answer choices. This exercise develops spelling and sensitivity to letter-sound correspondences.

*Fish Frenzy:* In this exercise, a fishing pelican pronounces a word. Then a series of spoken and/or written words (on fish) fly across the pond and the participant clicks on the word when it matches the pronounced word. This exercise improves decoding skills, identification of sight words, and auditory memory.

*Leaping Lizards:* This exercise uses the “cloze task,” in which a sentence has a word missing. The participant must select the correct word from four choices to complete the sentence. This exercise improves vocabulary skills and sentence comprehension.

*Ant Antics:* The participant is presented with a picture and then asked to pick one of the four alternatives that best describes an aspect of that picture. This exercise improves vocabulary skills and sentence comprehension.

*Dog Bone:* In this exercise, the participant reads or listens to a passage and answers comprehension questions relating to each passage. The response choices are presented as words or short phrases. The goal of this exercise is to improve listening and reading comprehension and working memory skills as measured by performance on multiple choice questions.

### **Assessments**

All students were evaluated with the Test of Word Reading Efficiency (TOWRE) before Fast ForWord use and again after the Fast ForWord group participated on the product.

**Test of Word Reading Efficiency (TOWRE):** The TOWRE is a nationally normed measure of word reading accuracy and fluency. It monitors growth of the ability to “sound out” words and the ability to accurately recognize familiar words as whole units (“sight words”). The TOWRE contains two subtests:

The Sight Word Efficiency subtest assesses the number of real printed words accurately identified within 45 seconds. Phonemic Decoding Efficiency measures the number of pronounceable printed nonwords accurately decoded in 45 seconds.

The Institute for the Development of Educational Achievement, in accordance with the Reading First legislation, determined that the TOWRE subtests are appropriate outcome assessments for accurately measuring improvement in the reading fluency skills of children in early elementary school.

### **Analysis**

Scores were reported in terms of standard scores. Data were analyzed using a repeated measures multivariate analysis of variance (MANOVA). 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 month of January of the 2004 – 2005 school year, the elementary school chose to use a combination of the 48- and 90-Minute Fast ForWord to Reading 2 Protocols. These protocols call for students to use the product for 48 or 90 minutes per day, 5 days a week for four to twelve weeks.

Twenty-five students were randomly assigned to the Fast ForWord group, and 25 students served as a comparison group. Random assignment to either the Fast ForWord or comparison group was designated using SPSS statistical software. All 50 students in the study had previously used one or more Fast ForWord products before the start of this study. However, none of the students had Fast ForWord to Reading 2 product use prior to this study, and only the Fast ForWord group used this Reading product during the study. Detailed usage information for the Fast ForWord group is shown in Table 1.

Figure 1 shows the average daily progress through the Fast ForWord to Reading 2 product exercises for the 25 students who used the product. 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 to Reading 2	25	21	32	79%	78%

Table 1. Usage data showing the number of students who used the Fast ForWord to Reading 2 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 participation level.

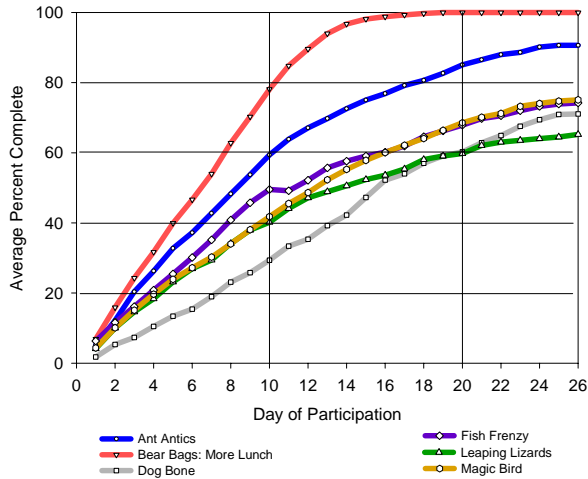


Figure 1. Average daily progress through the Fast ForWord to Reading 2 product exercises. Results from 25 students are shown.

### Assessment Results

**Test of Word Reading Efficiency (TOWRE):** The TOWRE was used to evaluate the reading skills of the 50 students in this study, both before and after the Fast ForWord group participated on the Fast ForWord to Reading 2 product. TOWRE scores were reported in terms of standard scores which were used in the analyses.

Students as a whole were performing within the average range of reading ability before Fast ForWord use. At the time of post-testing, after the Fast ForWord group participated on the product, both groups of students had made significant improvements on both subtests of the TOWRE, with the Fast ForWord group making significantly greater improvements in reading skills than the comparison group (Figure 2).

On the Sight Word subtest, the Fast ForWord group of students improved their average score by 7.9, over half of a standard deviation, compared to an improvement of 3.4 by the comparison group. The Fast ForWord group had an average gain of 10.7 on the Phonemic Decoding subtest, while the comparison group improved by 6.5 (Table 2).

A MANOVA (Table 3) showed a significant difference by time and by subtest. Both groups showed improvements between pre- and post-testing with significantly different improvements by group. However, differences between the improvements on the Sight Word Reading subtest and the Phonemic Decoding subtest were not significant. Additionally, group differences in improvements over time did not vary by subtest. There was a significant difference by time by group, indicating the Fast ForWord group had significantly greater improvements over time than the comparison group.

Effect size helps evaluate the size of the difference between the two groups being compared. In this study, the effect size, measured by the standardized mean difference in improvement, was 0.62 for the overall TOWRE score, 0.54 for the sight-reading subtest, and 0.47 for the decoding subtest. This is a moderate effect size and suggests that using Fast ForWord to Reading 2 helps students improve their reading fluency by approximately ½ standard deviation.

Group	Subtest	n	Before		After	
			Mean	SE	Mean	SE
Fast ForWord	Sight Word	25	85.1	2.7	93.0	3.2
	Decoding	25	90.0	1.9	100.7	3.0
Comparison	Sight Word	25	99.7	1.7	103.1	2.1
	Decoding	25	103.8	2.1	110.3	2.5

Table 2. Twenty-five third grade students made significant gains and outperformed a comparison group of their peers after using the Fast ForWord to Reading 2 product.

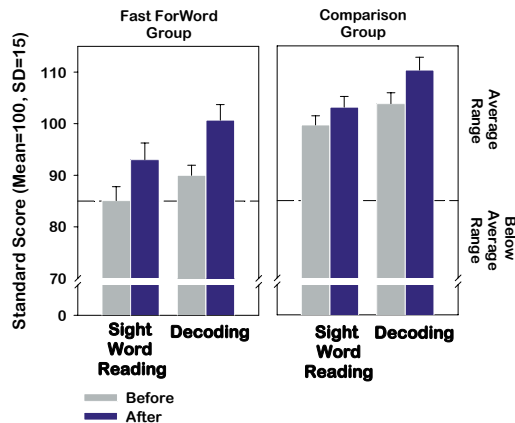


Figure 2. Fast ForWord participants significantly outperformed a comparison group in reading skills after using the Fast ForWord to Reading 2 product.

	MANOVA	
	df	f
subtest	48	37.8*
time	48	45.9*
time x group	48	4.2*

Table 3. A MANOVA showed that students who used the Fast ForWord to Reading 2 product had significantly greater improvements on tests of reading fluency than a comparison group. \*p<0.05.

## DISCUSSION

During January of the 2004 – 2005 school year, a group of 25 students from an elementary school used the Fast ForWord to Reading 2 product. Overall, students made significant improvements on reading fluency after Fast ForWord participation and significantly outperformed a comparison group of their peers who did not use the product. These findings demonstrate that 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

Strong cognitive and linguistic skills provide a critical foundation for building reading and writing skills. The Fast ForWord to Reading 2 product builds this foundation through development of auditory memory, attention, and sequencing, and by exercising early reading skills including phonics, vocabulary, fluency

and comprehension. This study demonstrates that students who used the Fast ForWord to Reading 2 product improved their reading skills more than a comparison group that used the standard curriculum. These results suggest that using the Fast ForWord product strengthened the students’ foundational skills and will allow them to benefit more from the classroom curriculum.

### Notes:

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