

# Improved Reading Skills by Students in the Sampson County Schools who used Fast ForWord® Products

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## 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 multiple school case study using nationally normed assessments and high stakes assessments. **Participants:** Study participants were students attending the Sampson County Schools in Clinton, North Carolina. **Materials & Implementation:** Following staff training on the Fast ForWord products, a group of students used the products during the 2006-2007 school year and had their reading abilities assessed with the North Carolina End-of-Grade Test and/or the STAR Reading test. **Results:** Students, on average, significantly improved in reading ability after using Fast ForWord products. Average gain on the End-of-Grade test (EOG) was 19% greater for the Fast ForWord participants than for students in comparable grades district-wide. Participants whose reading performance was, on average, more than 2 years behind grade level improved three months in their reading achievement on the STAR Reading test.

**Keywords:** North Carolina, public, elementary, middle school, high school, rural, observational study, Fast ForWord Language, Fast ForWord Language to Reading, Fast ForWord to Literacy, Fast ForWord to Literacy Advanced, STAR Reading, End-of-Grade Test (EOG).

## 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 Sampson County Schools were interested in evaluating the effectiveness of an optimal learning environment with a focus on early reading and cognitive skills as a way to improve the reading achievement of students in a school setting. In this study, commercially available computer-based products (Fast ForWord Language, Fast ForWord

Language to Reading, Fast ForWord to Literacy, and Fast ForWord to Literacy Advanced) were used to evaluate the effectiveness of this optimal learning environment approach for improving the reading achievement of their students.

## METHODS

### Participants

First settled in 1740, Clinton, North Carolina, is 60 miles south of Raleigh. A rural area, the Sampson County Schools provide an education for approximately 8,000 students, with 16 schools serving kindergarten through twelfth grade.

The Sampson County Schools chose to use the Fast ForWord products as part of their educational curriculum during the 2006-2007 school-year. Three hundred six students at five schools, used the products and had their reading skills evaluated with the STAR Reading test. In addition, the North Carolina End-of-Grade Tests (EOG) that are North Carolina's high stakes tests, were used to evaluate the progress of the elementary and middle school students. 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 products used by the Warren County Schools, Fast ForWord Language, Fast ForWord Language to Reading, Fast ForWord to Literacy, and Fast ForWord to Literacy Advanced, 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 these products, all help develop certain critical skills as detailed in the following exercise descriptions.

*Circus Sequence<sup>1</sup>/Space Racer<sup>2</sup> and Trog Walkers/Sky Rider<sup>3</sup>*: 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 McDonald's Flying Farm<sup>1</sup> and Galaxy Goal<sup>2</sup>*: Students hear a single syllable that is repeated several times, and then interrupted by a different syllable. Students must respond when they hear the change in the syllable. This exercise improves auditory processing, develops phoneme discrimination, and increases sustained and focused attention.

*Phoneme Identification<sup>1</sup>/Spin Master<sup>2</sup>, Polar Cop/Meteor Ball<sup>3</sup>, and Treasure in the Tomb/Lunar Leap<sup>3</sup>*: 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/Meteor Ball* also develops sound-letter correspondence skills. *Treasure in the Tomb/Lunar Leap* also develops grapheme recognition.

*Phonic Match<sup>1</sup>/Lunar Tunes<sup>2</sup> and Bug Out!/Laser Match<sup>3</sup>*: 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!/Laser Match* exercise develops skill with sound-letter correspondences as well as working memory.

*Phonic Word<sup>1</sup> and Star Pics<sup>2</sup>*: 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.

*Stellar Stories<sup>1</sup> and Start-Up Stories/Galaxy Theater<sup>3</sup>*: Students listen to stories, then answer multiple-choice questions about them, match pictures to sentences, and follow commands of increasing complexity. As participants integrate information across the sentences of a paragraph, and across the paragraphs of a story, they build listening comprehension skills. These exercises simultaneously develop basic language skills such as auditory word recognition, auditory memory, and basic vocabulary, along with more complex language skills such as attending to word and sentence structure. These exercises provide a comprehensive "cross-training" of oral language skills, to create a solid foundation for reading.

## Assessments

Before and after Fast ForWord participation, student reading skills were assessed with the North Carolina End-of-Grade Test and the STAR Reading test. School personnel administered the assessments, and reported the scores for analysis.

**North Carolina End-of-Grade Test (EOG):** End of Grade exams are North Carolina's high stakes assessment. Administered to students in third through eighth grade, they evaluate a students' reading and math skills. The assessment is administered twice to third graders so there is a basis of comparison.

**STAR Reading:** The STAR Reading assessment is a criterion- and norm-referenced test of reading ability. It consists of computer

<sup>1</sup> Exercise from the Fast ForWord Language product.

<sup>2</sup> Exercise from the Fast ForWord to Literacy product.

<sup>3</sup> Exercise from the Fast ForWord Language to Reading/Fast ForWord to Literacy Advanced product.

adaptive multiple choice questions and is appropriate for grades 1 through 12.

**Analysis**

The District reported End-of-Grade (EOG) Test scores in terms of scaled scores while grade equivalents were used to report the STAR Reading results. Scores were analyzed using paired t-tests with 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 and attendance levels). During the 2006-2007 school year, the Sampson County Schools chose to use the 48- and 50-Minute protocols for the Fast ForWord products. These protocols called for students to use the product for 48 or 50 minutes a day, five days per week for eight to twelve weeks. Detailed product use is shown in Table 1.

	Number of Students	Days Participated	Number of Calendar Days	Percent Complete	Participation Level	Attendance Level
Fast ForWord Language	131	31	53	80%	100%	85%
Fast ForWord Language to Reading	100	30	70	69%	100%	81%
Fast ForWord to Literacy	169	34	56	91%	98%	82%
Fast ForWord to Literacy Advanced	129	28	51	75%	98%	85%
Total	306	54	98	-	-	-

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. Total values reflect the average total number of days that students used products. Note: Students often use multiple products.

**Assessment Results**

**End-of-Grade Test (EOG):** Two hundred fifty-three participants had their EOG Reading scaled scores reported for both 2006 and 2007. The students were in third through eleventh grades with the majority of the students in third through eighth grades. Typical improvement on the EOG varies by grade, and was not available for the five students in high school. Therefore, they are not included in this analysis. Matching the third through eighth grade participants to average improvements of students in comparable grades district-wide showed that students who used the Fast ForWord products improved an average of 4.9 points, 19% more than students in comparable grades district-wide (Figure 2).

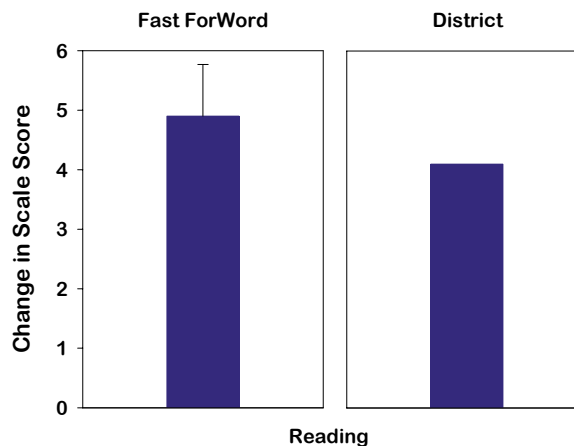


Figure 2. Students who used the Fast ForWord products gained, on average, 19% more than students in comparable grades district-wide. Results from 248 students are shown.

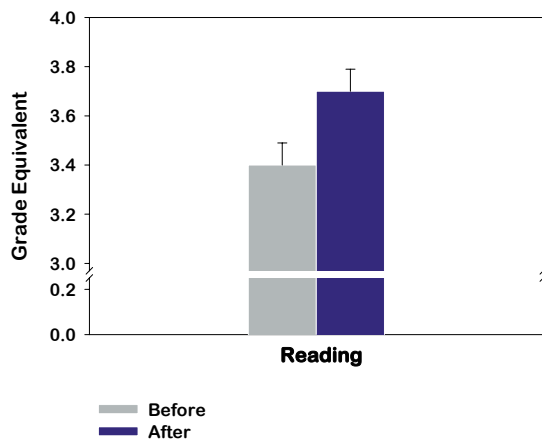


Figure 3. After Fast ForWord participation, students, on average, improved from the mid third grade level to the high third grade level. Results from 291 students are shown.

**STAR Reading:** Data from the STAR Reading test were reported in terms of grade equivalent scores for all 291 students in second through eighth grade (average grade of 5.5). Four high school students also had STAR results, but they were reported in terms of a different measure, and were too small a group to analyze separately. On average, the students' reading level was initially 3.4 indicating that the students' reading performance was more than 2 years behind grade level. After using the Fast ForWord products, the students made significant improvements in their reading performance, with their average reading level increasing by three months to a level of 3.7 (Figure 3; Table 2).

	n	Before		After		t statistic
		Mean	SE	Mean	SE	
STAR Reading	291	3.4	0.09	3.7	0.09	4.49*

Table 2. Overall, the students who used the Fast ForWord products made significant gains in their reading achievement. \* $p < .05$

## DISCUSSION

During the 2006-2007 school year, students attending the Sampson County Schools used the Fast ForWord products and participated in the study reported here. The students were from schools of all levels: elementary, middle, and high school. Many of the students were in Exceptional Children programs, and, on average, the students were reading at a level more than two years below their grade level. However, the students were able to make a statistically significant improvement of three months between the pre- and post-participation assessments. This improvement is even more impressive when the past performance of these particular students is taken into consideration.

In addition to the improvements that were evident in the students EOG and STAR results, it is important to take note of other changes in the students. Many teachers at the elementary, middle, and high schools noted that after using the Fast ForWord products, the students were more focused and participated more in the classroom. In addition, the students had more self-confidence. Teachers also found that students were better at following directions and the teachers did not have to repeat the instructions as many times.

## 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 Sampson County Schools made significant gains in their reading ability. This suggests that using the Fast ForWord products strengthened the students' foundational skills and better positioned them to benefit from the classroom curriculum.

### Notes:

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