

# Improved Reading Skills by Students in the Chamberlain School District who used Fast ForWord® Products: 2008 - 2011

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## ABSTRACT

**Purpose:** This study investigated the effects of the Fast ForWord products on the reading skills of elementary school students who used the products within the curriculum in a school setting.

**Results:** After Fast ForWord participation, students on average made statistically significant gains in early reading skills, with the 237 students improving an average of 1 year and 9 months in the 8 months between assessments. Students who completed more products tended to achieve greater gains in their early reading skills with the group that completed only one product improving by one year in the three months between assessments, and the group that completed 5 or more products improving by three years and four months in the one year and one month between assessments. Reading Progress Indicator was found to have a statistically significant correlation with the STAR Reading and Dakota STEP assessments, with the correlation coefficients ranging from 0.64 to 0.74.

**Study Design & Participants:** The design of this study was a single school case study using nationally-normed and high stakes assessments. Study participants were elementary school students in the Chamberlain School District of Chamberlain, South Dakota.

**Materials & Implementation:** Following staff training on the Fast ForWord products, the students started using the Fast ForWord products during the 2008-2009 school year and had their early reading skills evaluated before and after Fast ForWord participation with Reading Progress Indicator. In the spring of 2011, many students were also evaluated with the South Dakota State Test of Educational Progress (Dakota STEP) and/or the STAR Reading assessment.

**Keywords:** South Dakota, elementary school, rural district, observational study, Native American, Fast ForWord Language Basics, Fast ForWord Language, Fast ForWord Language to Reading, Fast ForWord Reading Level 1, Fast ForWord Reading Level 2, Fast ForWord Reading Level 3, Fast ForWord Reading Level 4, South Dakota State Test of Educational Progress (Dakota STEP), STAR Reading, and/or Reading Progress Indicator (RPI).

## 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).

Further research has demonstrated that the use of an optimal learning environment with a focus on reading and cognitive skills not only benefits the auditory processing and language skills of school children who have specific language impairments, but can benefit the reading achievement of a wide range of students.

The Chamberlain 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 the reading and language achievement of their students. In this study, commercially-available, computer-based products (Fast ForWord Language Basics, Fast ForWord Language, Fast ForWord Language to Reading, Fast ForWord Reading Level 1, Fast ForWord Reading Level 2, Fast ForWord Reading Level 3, Fast ForWord Reading Level 4) were used to evaluate the effectiveness of this approach for improving the reading and language achievement of elementary school students.

## **METHODS**

### **Participants**

The Chamberlain School District 07-1 is a small, rural district in Chamberlain, South Dakota. It has three schools and serves roughly 900 students. The focus of this study was the elementary school, where half the students are eligible for free or reduced price lunches and 17% receive services for Special Education. Approximately 58% of the students are Caucasian and 38% are Native American. During the 2008-2009 school year, the Chamberlain School District started using the Fast ForWord products at Chamberlain Elementary, a K-6 school.

This study focuses on 237 students attending Chamberlain Elementary who have used the Fast ForWord products at some point since the fall of the 2008-2009 school year. Study participants were in the third and fourth grades. Before and after Fast ForWord participation, students were

assessed with Reading Progress Indicator (RPI). The district administers other assessments including the Renaissance Learning's STAR Reading assessment and the South Dakota State Test of Educational Progress (Dakota STEP) to students. Spring, 2011 scores from both the STAR Reading and the Dakota STEP were provided for a correlation between RPI scores and those of the STAR and/or Dakota STEP. School personnel administered the assessment 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 the online reporting tool, Scientific Learning® Progress Tracker, to monitor student performance; and techniques for measuring the gains students have achieved after Fast ForWord participation.

### **Materials**

The Fast ForWord products are computer-based products that combine an optimal learning environment with a focus on early reading and cognitive skills. Each product includes several exercises designed to build cognitive skills critical for all learning, such as attention and memory. These exercises simultaneously develop academic skills critical for reading, such as English language conventions, phonemic awareness, vocabulary, and comprehension.

Some of the primary skills developed by these products are outlined in Table 1. More detailed descriptions of the exercises and learning modes within each product can be found online at <http://www.scientificlearning.com/exercises>.

Primary Skills Product Name	Listening Accuracy & Auditory Sequencing	Auditory Word Recognition	English Language Conventions	Following Directions	Listening Comprehension	Phonological Skills / Phonemic Awareness	Phonics / Word Analysis	Fluency	Vocabulary	Reading Comprehension
Fast ForWord Language Basics	•									
Fast ForWord Language v2	•	•	•	•		•			•	
Fast ForWord Language to Reading v2	•		•	•	•	•	•		•	
Fast ForWord Reading Level 1					•	•	•	•	•	•
Fast ForWord Reading Level 2					•	•	•	•	•	•
Fast ForWord Reading Level 3						•	•	•	•	•
Fast ForWord Reading Level 4						•	•	•	•	•

Table 1: The Fast ForWord and Reading Assistant products work on numerous cognitive and early reading skills. The primary skills focused on by each product are noted in the table.

### Assessments

Before and after Fast ForWord participation, student reading and language skills were assessed with Reading Progress Indicator (RPI). In addition, in Spring, 2011, students were assessed with the STAR Reading assessment and/or South Dakota State Test of Educational Progress (Dakota Step).

**Reading Progress Indicator (RPI):** Reading Progress Indicator is a computerized assessment designed to rapidly measure the impact of the Fast ForWord products. It assesses a student's early reading skills including phonemic awareness, decoding, vocabulary, and comprehension.

**Renaissance Learning's STAR Reading (STAR):** The STAR Reading assessment is a criterion and norm-referenced test of reading ability. It consists of computer adaptive multiple choice questions and is appropriate for students in grades 1 through 12.

**South Dakota State Test of Educational Progress (Dakota Step):** The Dakota STEP is administered each spring to students in 3<sup>rd</sup> through 8<sup>th</sup> grade and 11<sup>th</sup> grade and measures students' mastery of the South Dakota State Academic Standards. Students receive a scale score that is grade, year, and subject dependent. Students also receive one of four achievement levels ranging from Below Basic to Advanced.

### Analysis

Scaled scores and normal curve equivalents were used to analyze Reading Progress Indicator scores. Data

were analyzed using a paired t-test; data were converted to grade-equivalent reading levels for reporting purposes. Correlations were calculated between the RPI scaled scores, the Dakota STEP and STAR scale scores. The Dakota STEP correlations were calculated for each grade level. 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 and attendance levels). During the 2009 - 2011 school years, Chamberlain Elementary School chose to use the 30-Minute protocols. These protocols call for students to use the products for 30 minutes a day, five days per week for 12 to 16 weeks. Since the initial Fast ForWord implementation during the 2008-2009 school year, students have completed an average of 2.1 products each with 87% completing at least one product and 54% completing at least two products. Detailed product use is shown in Table 2.

2008 – 2011 Product Use						
	Number of Students	Days Participated	Number of Calendar Days	Percent Complete	Participation Level	Attendance Level
Fast ForWord Language Basics	265	4	7	100	100	88
Fast ForWord Language v2	276	41	71	89	96	82
Fast ForWord Language to Reading v2	244	40	74	68	95	79
Fast ForWord Reading Level 1	159	26	49	86	98	79
Fast ForWord Reading Level 2	127	33	61	77	98	78
Fast ForWord Reading Level 3	75	35	63	61	98	78
Fast ForWord Reading Level 4	22	18	29	44	90	83
Total	283	114	213	-	96	80

Table 2. Usage data showing the number of students who used the Fast ForWord products during the 2008 – 2011 school years, 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: Most students used multiple products with 54% completing two or more products.

## Assessment Results

**Reading Progress Indicator (RPI):** RPI was administered before students used the Fast ForWord products, and then again after each Fast ForWord product. Two hundred thirty-seven students in first through fourth grade had valid pre- and post-participation scores and are included in the RPI evaluation. Of the students, 215 (91%) showed improvement. Their average grade level was 3.4, right on their skill-level of 3.4. Seven and one-half months later, after Fast ForWord participation, the students' skills had improved to the 5.3 level, an improvement of nearly two years. This corresponds to improving from the 41<sup>st</sup> percentile to the 75<sup>th</sup> percentile (Figure 1).

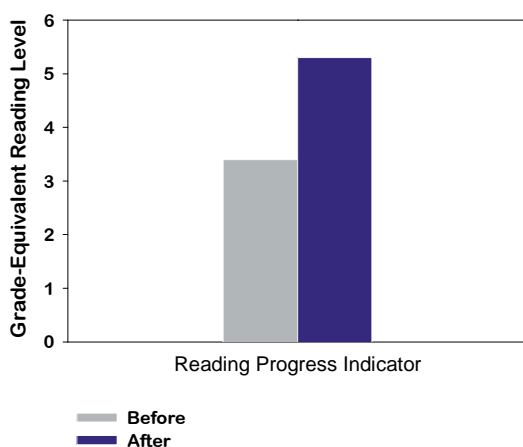


Figure 1. RPI was administered to 237 students before and after participation. On average, there were 7½ months between the two assessments. During this time, students improved their early reading skills by an average of 1 year and 9 months.

Students who completed more products tended to have greater improvements. Figure 2 shows the typical starting and finishing levels for groups that completed

different numbers of products. On average, the time between the first and last assessment increased with the number of products completed, ranging from a three months for those who completed one product to one year and one month for those who completed five or more products.

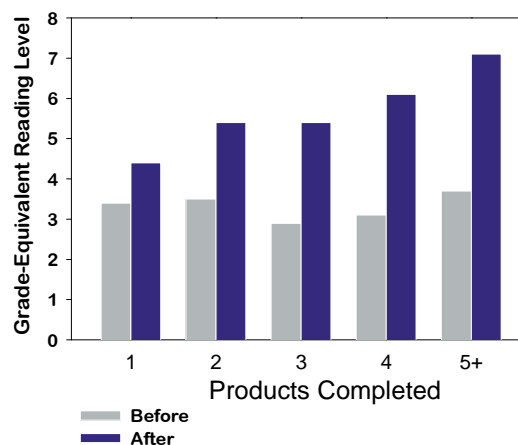


Figure 2. Students who completed more products tended to have greater improvements on their early reading skills. On average, there was a one year improvement in a three-month period for the 81 students who completed one product, and a three year and four month improvement in a period of one year and one month for the 21 students who completed five or more products. Fast ForWord Language Basics is not included in the number of products completed.

### Correlations between RPI and other assessments:

Students were assessed with RPI before they started using the Fast ForWord products and again upon completion of each product. The Dakota STEP was administered in April, 2011, and the STAR was administered in May, 2011. In the interest of using scores only from tests administered in close proximity to each other, the focus was on RPI scores from

February 1, 2011 through June 1, 2011. There were 72 students who had RPI scores from that window as well as STAR scores; there were 60 students in 4<sup>th</sup> grade, and 12 in 3<sup>rd</sup> grade who had RPI scores from that window as well as Dakota STEP scores.

The correlation between RPI and STAR scores was 0.71 ( $p < 0.01$ ) which means that 50% of the variability in the STAR scores can be explained by variations in the RPI scores. Figure 3 shows the correlation between RPI and STAR scores.

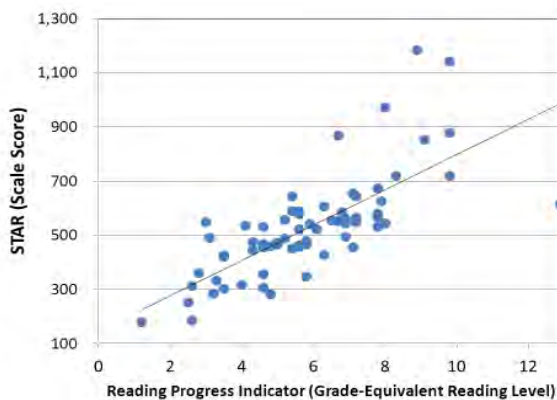


Figure 3. The correlation between the STAR and RPI was 0.71. The calculations were performed using scale scores for both the STAR and RPI. For purposes of clarity, RPI grade-equivalent reading levels were used for the graph.

Since the Dakota STEP scores are on grade-dependent scales, the correlation had to be done separately for each grade. The correlation between RPI and Dakota STEP scores was 0.64 ( $p < 0.05$ ) for the 3<sup>rd</sup> graders ( $n = 12$ ) and 0.74 ( $p < 0.01$ ) for the 4<sup>th</sup> graders ( $n = 60$ ). This means that variations in RPI account for 41% and 55% of the variation in the Dakota STEP scores for 3<sup>rd</sup> and 4<sup>th</sup> graders, respectively. Figure 4 shows the correlation between RPI and Dakota STEP scores.



Figure 4. The correlation between the Dakota STEP and RPI was ranged from 0.64 (3<sup>rd</sup> graders) to 0.74 (4<sup>th</sup> graders). The calculations were performed using scale scores for both the Dakota STEP and RPI. For purposes of clarity, RPI grade-equivalent reading levels were used for the graph.

## DISCUSSION

During the 2008 – 2011 school years, 3<sup>rd</sup> and 4<sup>th</sup> graders at Chamberlain Elementary School used the Fast ForWord products. Most of the students used multiple products with some students completing five or more products. Overall, students who completed more products showed greater improvements on their reading skills, with the group that completed at least five products improving their skills by nearly 3½ years in the 1 year and 1 month between assessments.

The STAR and Dakota STEP scores, which were only available from one administration, were correlated with RPI scores that were achieved within a few months of the STAR and Dakota STEP administrations. The results showed that both the STAR and the Dakota STEP have statistically significant correlations with RPI, with the correlation coefficients ranging from 0.64 to 0.74.

## 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 Chamberlain School District made statistically significant gains in their reading skills. These results replicate other studies and suggest 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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