

# **Improved Reading Achievement by Students in the Spotsylvania 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 and achievement of students who used the products within the curriculum in a school setting.

**Results:** Students made significant improvements on Reading Progress Indicator, a measure of early reading skills. Across students who benefitted, the average improvement was one year and two months. Fast ForWord participants at the middle and high school made greater improvements in their reading achievement than students in comparison groups. Average improvement for the participants was more than 7 months during the 18 weeks between assessments – a good amount for students performing one to two years below grade level. The number of high school students passing the SOL in History and Science increased by more than 10%. Not surprisingly, teachers reported that there were positive changes in student attitudes and attention.

**Study Design:** The design of this study was a multiple school study using high stakes and nationally normed tests. **Participants:** Study participants were elementary, middle and high school students who were attending schools in the Spotsylvania County Schools in central Virginia.

**Methods & Implementation:** Before and after participation on the Fast ForWord products, students were evaluated with the Standards of Learning Test (SOL), Gates-MacGinitie Reading Tests and/or Reading Progress Indicator.

**Keywords:** Virginia, elementary school, middle school, high school, rural, observational study, Fast ForWord Language, Fast ForWord Language to Reading, Fast ForWord Literacy, Fast ForWord Literacy Advanced, Fast ForWord Reading Level 3, Fast ForWord Reading Level 4, Fast ForWord Reading Level 5, Standards of Learning Test (SOL), Gates-MacGinitie Reading Test, and/or Reading Progress Indicator

## **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 Spotsylvania County Schools were interested in evaluating the impact of an optimal learning environment with a focus on early reading and cognitive skills on 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 Literacy, Fast ForWord Literacy Advanced, Fast ForWord Reading Level 3, Fast ForWord Reading Level 4, and Fast ForWord Reading Level 5) were used to evaluate the effectiveness of this approach at improving the reading skills and English proficiency of students.

## **METHODS**

### **Participants**

The Spotsylvania County Schools are located in central Virginia. A rural district, the schools service more than 24,000 students at 31 schools. This report focuses on students at three schools that used the Fast ForWord products: Robert E. Lee Elementary School, Ni River Middle School, and Massaponax High School.

Students in the study were identified as being in need of remediation based upon their scores on the Virginia Standards of Learning (SOL) test, and classroom performance. The selected students were divided in two: one group used the Fast ForWord products, the other group served as a comparison for student performance on the Gates-MacGinitie.

Students were evaluated before and after product use with Reading Progress Indicator. In addition, students were evaluated at the beginning and end of the term with the Gates-

MacGinitie Reading Tests. Finally, students in 3<sup>rd</sup> through 12<sup>th</sup> grade were evaluated with the Standards of Learning in May, 2008 and again in May, 2009.

School personnel administered assessments to the students and analyzed the Standards of Learning and Gates-MacGinitie results. Reading Progress Indicator results were reported back to Scientific Learning 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. 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 below in Table 1. More detailed descriptions of the exercises and learning modes within each product can be found online at <http://www.scientificlearning.com>.

Primary Skills	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
Product Name										
Fast ForWord Language v2	•	•	•	•		•			•	
Fast ForWord Language to Reading v2	•		•	•	•	•	•		•	
Fast ForWord Literacy	•	•	•	•	•	•			•	
Fast ForWord Literacy Advanced	•		•	•	•	•	•		•	
Fast ForWord Reading Level 3						•	•	•	•	•
Fast ForWord Reading Level 4						•	•	•	•	•
Fast ForWord Reading Level 5						•	•	•	•	•

Table 1: The Fast ForWord 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, students were evaluated with Virginia's Standards of Learning (SOL), the Gates-MacGinitie Reading Tests, and/or Reading Progress Indicator (RPI).

**Reading Progress Indicator:** Reading Progress Indicator is a computer-based assessment designed to rapidly measure the effects of the Fast ForWord products. There are four levels of the assessment, each designed for a specific grade range. Each test level measures phonological awareness, decoding, vocabulary and comprehension. Scores are reported as grade equivalents and percentiles.

**Gates-MacGinitie Reading Tests (GMRT):** The GMRT is used to assess a student's decoding, vocabulary, and passage comprehension skills. The test has two components, independently assessing reading vocabulary and comprehension.

The Vocabulary subtest measures the student's reading vocabulary by asking the student to choose one word or phrase that means most nearly the same as a presented word. The test contains 45 questions.

In the Comprehension subtest, the student's ability to read and understand different types of prose is measured. The test contains 11 passages of various lengths and about various subjects.

**Standards of Learning (SOL):** The Standards of Learning describe Virginia's expectations for student learning and achievement in kindergarten through 12<sup>th</sup> grade in various subjects including English, math, science, history, and social science. The Standards of Learning Tests evaluate the students' skills and knowledge with respect to the expectations.

### Analysis

Reading Progress Indicator scores were reported in terms of grade equivalents, percentiles,

scaled scores, and normal curve equivalents. Scaled scores and normal curve equivalents were used for the analyses but were converted to grade equivalents and percentiles for reporting purposes. The SOL scores were reported in terms of the percent passing while the Gates-MacGinitie scores were reported in terms of grade equivalent.

## RESULTS

### Participation Level

Research conducted by Scientific Learning shows a relationship between Fast ForWord 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 2008-2009 school year, students in the Spotsylvania County Schools used the 30- and 50-Minute Protocols: Students at the elementary school used the Fast ForWord Language v. 2 and the Fast ForWord Language to Reading v. 2 30-Minute Protocols while students at the middle and high school primarily used the 50-Minute protocols of the Fast ForWord Literacy and Fast ForWord Reading products. These protocols call for students to use the products for 30 or 50 minutes a day, five days per week for six to sixteen weeks. Detailed product use for all students who used Fast ForWord products during the 2008 – 2009 school year and had results from two or more RPI assessments are shown in Table 2.

	Number of Students	Days Participated	Number of Calendar Days	Percent Complete	Participation Level	Attendance Level
Fast ForWord Language v. 2	40	38	72	92	98	80
Fast ForWord Language to Reading v. 2	52	47	92	76	98	78
Fast ForWord Literacy	99	23	39	87	96	85
Fast ForWord Literacy Advanced	36	26	48	63	98	85
Fast ForWord Reading Level 3	119	29	54	81	93	80
Fast ForWord Reading Level 4	93	28	53	73	93	79
Fast ForWord Reading Level 5	39	23	50	27	94	73
Total	175	80	152	--	--	--

Table 2. Usage data showing the number of students who used the Fast ForWord Language 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: Many students use multiple products.

### Assessment Results

**Reading Progress Indicator:** Reading Progress Indicator is used to evaluate students' reading skills before and after Fast ForWord participation. One hundred seventy-five students had two or more valid assessments. One hundred thirty-one of those students (75%) improved at post-test. These students had an average grade level of 6.5 and, prior to Fast ForWord participation, were performing at an average reading level of 5.2. After an average of 15 weeks of Fast ForWord product use, the students' skills were reevaluated. Overall, the students made statistically significant improvements with average gains of one year and two months in reading ability, for a final reading

grade equivalent of 6.4. This corresponds to movement from the 19<sup>th</sup> to the 39<sup>th</sup> percentile. Dividing the results by school shows that the high school students' skills were the farthest below grade level (slightly more than two years) while the elementary school students' skills were closest to grade level (only 5 months behind). Robert E. Lee had the highest percentage of students making improvements (89%), while the Ni River Middle School students who improved had the largest improvements (1 year and 2 months). The high school students used the products for the shortest amount of time (with 66% of the students improving by an average of 1 year and 1 month in just 10 weeks). Results are summarized in Table 3 and Figures 1 – 3.

School	% Making Improvements	# Making Improvements	Grade	Initial Skill Level	Final Skill Level	Improvement	Time Between Tests (Weeks)
Robert E. Lee Elementary	89%	47	3.5	3.0	4.0	1 year	17
Ni River Middle	73%	40	7.1	5.9	7.1	1 year 2 months	19
Massaponax High	66%	44	9.3	7.2	8.3	1 year 1 month	10

Table 3. A majority of students made improvements on the Reading Progress Indicator assessment. The percent making improvement ranged from 66% at the high school to 89% at the elementary school. For the students making improvements, the average size of the improvement ranged from 1 year at the elementary school to 1 year and two months at the middle school.

Robert E. Lee Elementary School: Reading Progress Indicator

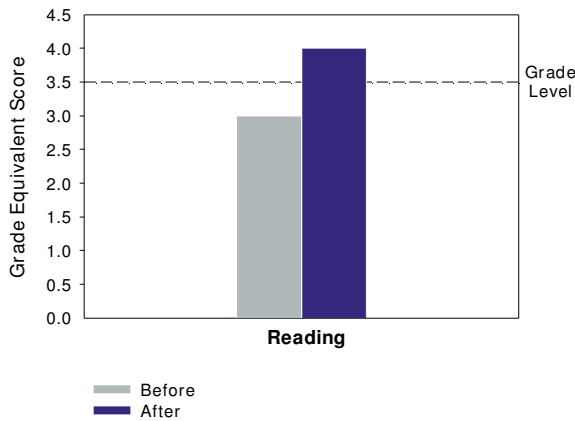


Figure 1. Average improvements for elementary school students who benefitted were one year. Results from 47 students are shown here.

Ni River Middle School: Reading Progress Indicator

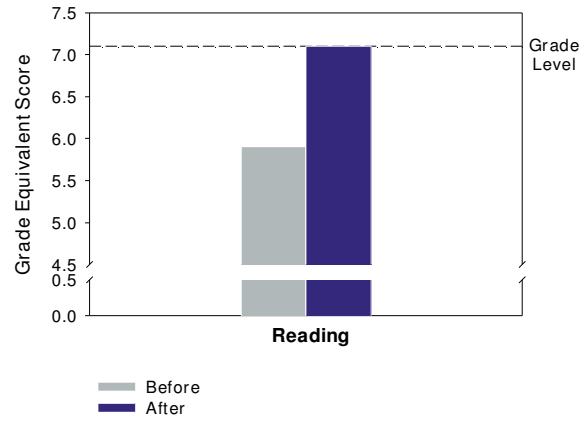


Figure 2. Average improvements for middle school students who benefitted were one year and two months. Results from 40 students are shown here.

Massaponax High School: Reading Progress Indicator

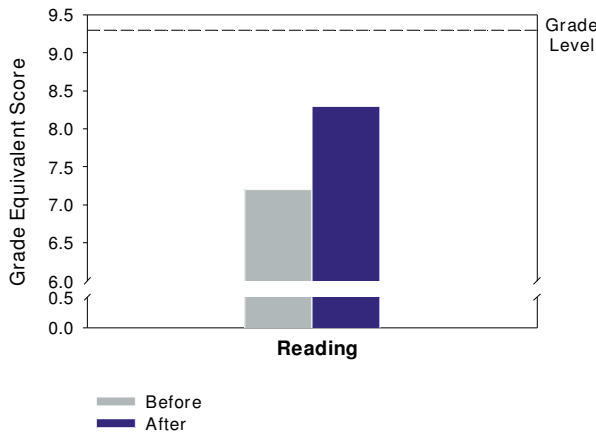


Figure 3. Average improvements for high school students who benefitted were one year and one month. Results from 44 students are shown here.

Gates-MacGinitie Reading Tests: Students in both the Fast ForWord, group, and the comparison group, were evaluated with the Gates-MacGinitie Reading test at the beginning of the term, and then again 18 weeks later, at the end of the term. On average, Fast ForWord participants at the middle and high school improved more than students in the comparison group. At the elementary school, average improvement for both groups was more than one year. Participant and control group results are summarized in the following table:

	Average Grade Level Equivalency (GLE) Gains: Participant Group	Average Grade Level Equivalency (GLE) Gains: Control Group
<b>Robert E. Lee Elementary School</b>	1.11 GLE	1.7 GLE
<b>Ni River Middle School</b>	0.78 GLE	- 0.2 GLE
<b>Massaponax High School</b>	0.73 GLE	0.60 GLE

Table 4. The Gates-MacGinitie Reading Tests were administered at the start of the term, and again 18 weeks later. At the middle and high school, students in the group that used the Fast ForWord products made greater improvements than students in the group that did not. At the elementary school, average improvement for both groups was more than one year.

Standards of Learning (SOL): The pass rates on the SOL for the high school students were examined. Students had results from 2007, 2008, and 2009 for the History and Science SOL Tests. Following the use of

the Fast ForWord products during the 2008 – 2009 school year, the percent of students passing the Science and History tests increased by more than 10% (Figure 4).

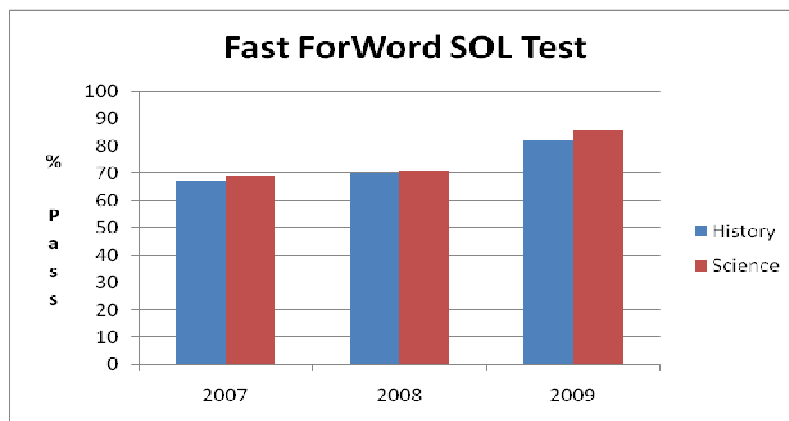


Figure 4. Students who used the Fast ForWord products during the 2008-2009 school year performed much better on the 2009 SOL.

**Classroom Performance:** Teachers reported student grades for English, Science, and Social Studies for the 2007-2008 school year (before Fast ForWord participation) and the 2008-2009 school year (during Fast ForWord participation). Students who participated in Fast ForWord showed improvement in classroom performance with the percent of A's, B's, and C's increasing over time; and the percent of D's

and F's decreasing over time. Below is a table, showing the percent of A's, B's, C's, D's, and F's, overtime, for students participating in Fast ForWord during the 2008 – 2009 school year. Across the three subjects, during the 2008-2009 school year, 64% of the students received A's, B's, or C's compared to 54% during the previous school year.

	A 2008	A 2009	B 2008	B 2009	C 2008	C 2009	D 2008	D 2009	F 2008	F 2009
Science 1 <sup>st</sup> 9 Wks.	6.9%	7.8%	22.4%	31.1%	25.9%	37.7%	25.9%	13%	19%	10.4%
Science 2 <sup>nd</sup> 9 Wks.	5.2%	1.3%	19%	25%	18.2%	18.8%	9%	18.8%	54.6%	35.4%
E. Sci. 3 <sup>rd</sup> 9 Wks.	0	7.8%	17.2%	31.2%	26.2%	22.1%	27.6%	20.8%	19%	18.2%
English 1 <sup>st</sup> 9 Wks.	0	33.3%	25%	44.4%	25%	0	25%	11.1%	25%	11%
English 2 <sup>nd</sup> 9 Wks.	0	11.1%	25%	33.3%	25%	0	50%	22.2%	0	33.3%
English 3 <sup>rd</sup> 9 Wks.	0	11.1%	50%	11.1%	25%	33.3%	25%	22.2%	0	22.2%
Social Studies 1 <sup>st</sup> 9 Wks.	11.1%	14.7%	28.6%	41.3%	17.5%	26.7%	19%	9.3%	23.8%	8%
Social Studies 2 <sup>nd</sup> 9 Wks.	4.8%	10.7%	22.2%	25.3%	27%	28%	22.2%	21.3%	23.8%	14.7%
Social Studies 3 <sup>rd</sup> 9 Wks.	3.2%	14.7%	23.8%	24%	34.9%	28%	14.3%	13.3%	23.8%	20%

Table 5. Grades for Fast ForWord participants at the high school improved. Prior to using the Fast ForWord products, during the 2007 – 2008 school year, 54% of the students grades were A's, B's, or C's. During the 2008 – 2009 school year, 64% of the grades were A's, B's, and C's.

## DISCUSSION

Students selected to take part in this study were in need of remediation based upon low SOL scores, and poor classroom performance. By the end of the study, the students had made substantial improvements in their reading skills and achievement. Based on Gates-MacGinitie scores, students at the elementary school had made more than one year in improvement in their reading achievement during the four months between tests. These students should now be working close to grade level. Average improvement for the middle and high school students was more than seven months – a sizeable improvement for students who were initially performing one to two years below grade level.

Anecdotal reports from the teachers indicated that there was a major positive shift in attitude at the elementary school. Likewise, teachers at the high school indicated positive changes in the students' attitudes and attention. These changes are consistent with students who have improved foundational learning skills – who can remember a list of instructions, process a sequence of events, and take an active part in the activities going on around them.

## 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 Spotsylvania County Schools made substantial and significant gains in their reading achievement. This study supports other studies showing that using the Fast ForWord products strengthens students' foundational skills and helps them benefit more from the classroom curriculum.

## ACKNOWLEDGEMENTS

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### Notes:

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