

# Improved Reading Skills by Students in the Pawhuska School District who used Fast ForWord<sup>®</sup> to Reading 2

MAPS for Learning: Educator Reports, 11(20): 1-5

## ABSTRACT

**Purpose:** This study investigated the effectiveness of the Fast ForWord to Reading 2 software using two different implementations. Improvements in reading skills were compared following either a 30-Minute or 48-Minute daily protocol. The software product was implemented within the curriculum in an elementary school setting. **Study Design:** The design of this study was a two-group study conducted within a single school. A nationally-normed test was used to evaluate effectiveness. **Participants:** Study participants were 49 third-grade students attending Pawhuska Elementary School in the Pawhuska School District of Pawhuska, Oklahoma. Students were assigned to one of two groups; one group used the 30-Minute Protocol while the other group used the 48-Minute Protocol. **Materials & Implementation:** Following staff training on the Fast ForWord to Reading 2 product, both groups of students started to use the product in January of the 2006 – 2007 school year. Before and after Fast ForWord participation, student reading skills were evaluated with the Gates-MacGinitie Reading Tests (GMRT). **Results:** Students using the 30-Minute and 48-Minute daily protocols reached similar high levels of product completion over an average of 35 and 23 days of product usage, respectively. On average, students made statistically significant improvements in vocabulary skills and made smaller gains in comprehension skills after Fast ForWord Reading 2 participation.

**Keywords:** Oklahoma, elementary school, Native American, suburban district, experimental study, Title I, Fast ForWord to Reading 2, Gates-MacGinitie Reading Tests (GMRT).

## INTRODUCTION

Numerous research studies have shown that cognitive and linguistic 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 enhanced learning capacity and cognition. The software focused on creating an optimal learning environment for building the memory, attention, processing and sequencing skills found to be critical for reading success (Merzenich et al., 1996; Tallal et al., 1996). The research-proven Fast ForWord software show that an optimal learning environment that focused on building targeted reading and cognitive skills resulted in dramatic improvements in the language and reading skills of school children, with published results for children struggling with language acquisition (Merzenich et al., 1996; Tallal et al., 1996; Tallal, 2000) or experiencing academic reading failure (Miller et al., 1999; Tallal, 2004).

The Pawhuska School District was interested in evaluating the effectiveness of involving students in an optimal learning environment with a focus on early reading and cognitive skills for 30 minutes each day. They wanted to determine whether a 30-minute daily involvement was as effective at improving the reading

abilities of students as a 48-minute daily involvement. To perform this study, two different protocols of a commercially available computer-based product (Fast ForWord to Reading 2) were used to evaluate the effectiveness of the different daily requirements at improving the reading skills of early elementary school students.

## METHODS

### Participants

The Pawhuska School District, located in Pawhuska, Oklahoma, is a pre-Kindergarten through twelfth grade suburban school district with a student population of nearly 1,000. Pawhuska Elementary, one of the 4 schools in the district, chose to use the Fast ForWord to Reading 2 product during the beginning of the 2006 – 2007 school year and took part in this study.

Pawhuska Elementary is a pre-Kindergarten through third grade school serving approximately 300 students. Approximately 50 percent of the students are Native American and 45 percent are Caucasian. Pawhuska Elementary School is a Title I school.

Forty-nine third graders participated in this study. Half of the study participants were assigned to the 30-

Minute Fast ForWord to Reading 2 Protocol and the other half used the 48-Minute Fast ForWord to Reading 2 Protocol. The 30-Minute group consisted of third graders from one classroom. While using Fast ForWord, these students missed their regular computer class. The 48-Minute group consisted of students from two other classrooms. During Fast ForWord participation, some of the students missed working on advanced test-taking skills and independent seat work while other students from the other class missed independent reading remediation. None of these students had previously used Fast ForWord products.

All students had their vocabulary and comprehension skills evaluated with the Gates-MacGinitie Reading Tests (GMRT) before and after students used the Fast ForWord to Reading 2 product. Since the 30-Minute Protocol requires more days to complete, the students in the 30-Minute Protocol group post-tested at a later date than the students in the 48-Minute Protocol group. School personnel administered the assessments and returned the assessments to Scientific Learning Corporation for scoring and 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 the Fast ForWord product.

### **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). It helps the participant develop skills in the following areas: phonemic awareness, decoding of single-syllable words, and grapheme/phoneme associations.

*Magic Bird:* This exercise combines spelling and word-building practice with spelling patterns and word families commonly studied in second grade. The task is designed to emphasize the relationships between words by showing how one word can be turned into another by simply changing a single letter in any position. Using a click and drag interface, the participant must either select the missing letter to complete a partially-spelled word or rearrange scrambled letter tiles to spell a word. 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 develops decoding skills, identification of sight words, and auditory memory.

*Leaping Lizards:* This exercise uses the “cloze task,” in which a written and aurally presented sentence has a word missing. The participant must select the correct word to complete the sentence from four choices. Vocabulary skills and sentence comprehension are developed in this exercise.

*Dog Bone:* In this exercise, the participant listens to a passage and answers comprehension questions relating to each passage. The questions are aurally presented and written, and the response choices are presented as words or short phrases in *Dog Bone*. This exercise develops listening comprehension and working memory skills as measured by performance on multiple choice questions.

*Ant Antics:* The participant will be 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.

### **Assessments**

School personnel evaluated all study participants with the Gates-MacGinitie Reading Tests (GMRT) before and after Fast ForWord use. Tests were returned to Scientific Learning Corporation for scoring and analysis.

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

In the Vocabulary subtest, the child must choose the best word or phrase that means most nearly the same as the presented test word. This subtest measures a child's word knowledge.

In the Comprehension subtest, the child must read passages of varying difficulty. This subtest measures a child's understanding of complex written material.

### Analysis

Normal Curve Equivalents (NCE's) were used for the analyses. NCE's have a mean equal to 50 and a standard deviation approximately equal to 21. 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 spring semester of the 2006 – 2007 school year, Pawhuska Elementary chose to use the 30- and 48-Minute Fast ForWord to Reading 2 protocols. These protocols call for students to use the product for 30 or 48 minutes per day, 5 days a week for six to sixteen weeks.

Forty-seven students from the study had pre- and post-tests: 22 of the students used the 30-Minute Fast

ForWord to Reading 2 Protocol and 25 of the students served as a comparison group by using the 48-Minute Fast ForWord to Reading 2 Protocol. Prior to the study, teachers reported the students to be of similar academic abilities. Two students were not included in the data analysis because they started using one protocol of the Fast ForWord to Reading 2 product and then switched to the other.

The two groups of students reached comparable high completion levels on the product, but as predicted, the 30-Minute Protocol group required more days to complete the content. The 30-Minute Protocol group completed 90% of the content in 35 days and the 48-Minute Protocol group completed 93% of the content in 23 days. Detailed usage information for the two study groups is shown in Table 1.

Figure 1 shows the average daily progress through the Fast ForWord to Reading 2 exercises for the students who used the 30-Minute Protocol and Figure 2 shows progress for the 48-Minute Protocol group. 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 to Reading 2: <b>30-Minute Group</b>	22	35	64	90%	97%	86%
Fast ForWord to Reading 2: <b>48-Minute Group</b>	25	23	43	93%	100%	91%

Table 1. Usage data showing the number of students who used the different Fast ForWord to Reading 2 protocols along with group averages for the number of days participated, the number of calendar days between start and finish, the percentage of product completed, participation level, and attendance level.

**Learning Curves:  
30-Minute Protocol: Fast ForWord to Reading 2**

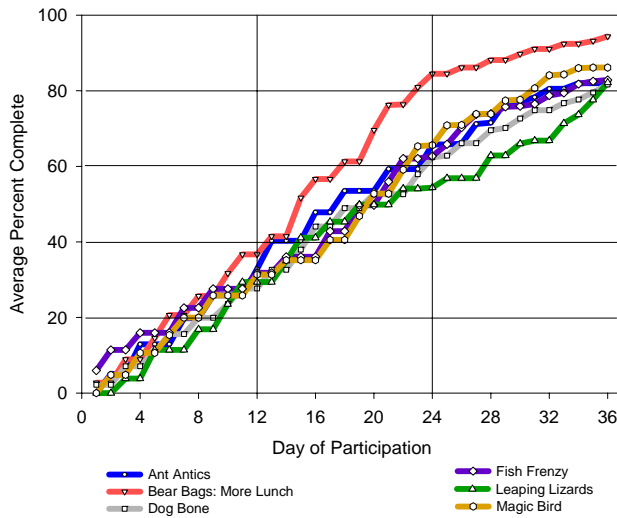


Figure 1. Average daily progress through the Fast ForWord to Reading 2 exercises on the 30-Minute Protocol. Results from 22 third graders are shown.

**Learning Curves:  
48-Minute Protocol: Fast ForWord to Reading 2**

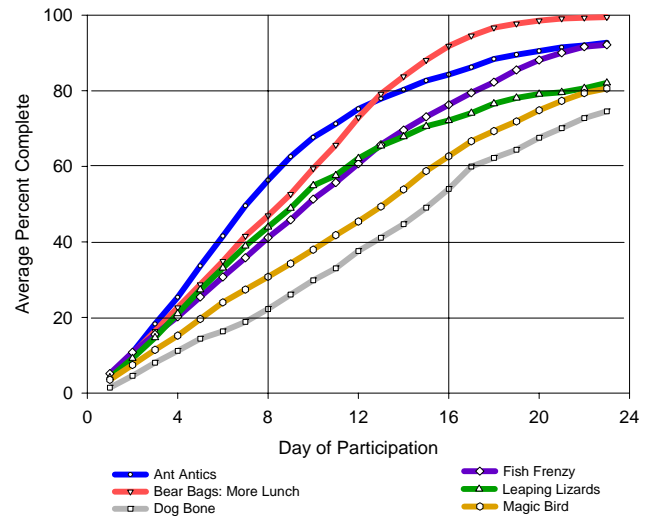


Figure 2. Average daily progress through the Fast ForWord to Reading 2 exercises on the 48-Minute Protocol. Results from 25 third graders are shown.

**Assessment Results**

Gates-MacGinitie Reading Tests (GMRT): The GMRT was used to evaluate the reading skills of the 47 students in this study, both before and after the students participated on the Fast ForWord to Reading 2 product. GMRT scores were analyzed using Normal Curve Equivalents (NCE's).

Statistically, there was no difference between the pre-test scores of the 30-Minute Protocol group and the 48-Minute Protocol group on the GMRT ( $p=0.13$  for Vocabulary and  $p=0.42$  for Comprehension). On average, before Fast ForWord use, both groups had reading abilities within the average range. Looking at the results of the two groups combined, on average,

Fast ForWord participants made significant gains in their vocabulary skills and smaller improvements in their comprehension skills. See Figure 3 for a graphical representation of these scores.

The 30-Minute Protocol group made significant improvements on Vocabulary subtest of the GMRT, gaining nearly a third of a standard deviation. A multivariate analysis of variance showed no significant interaction of group by time or group by test, showing that the two protocol groups achieved statistically similar gains on both subtests. See Table 2 for more detailed results on the performance of the Fast ForWord participants, split by protocol group.

	Subtest	n	Before		After		t-statistic
			Mean	SE	Mean	SE	
Fast ForWord to Reading 2: <b>30-Minute Group</b>	Vocabulary	22	47.3	4.2	54.1	4.4	3.4*
	Comprehension	22	50.5	4.9	51.0	4.4	0.2
Fast ForWord to Reading 2: <b>48-Minute Group</b>	Vocabulary	25	56.6	4.2	57.8	4.2	0.6
	Comprehension	25	55.7	4.2	55.7	4.2	0.0

Table 2. On average, students improved in reading skills after Fast ForWord use, with the 30-Minute Protocol group achieving statistically significant gains in vocabulary. \*  $p < 0.05$

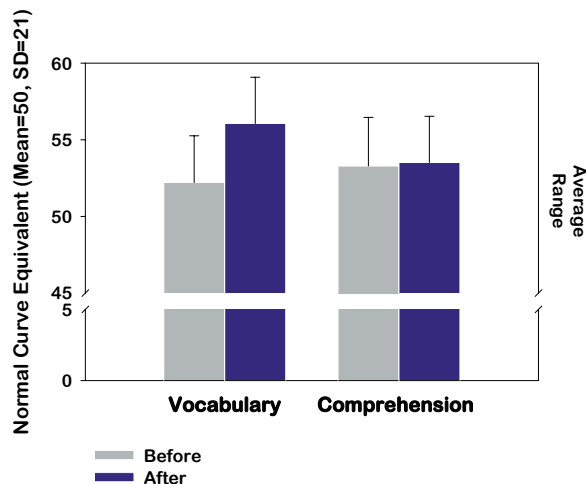


Figure 3. Fast ForWord participants made statistically significant improvements in vocabulary skills after using the Fast ForWord to Reading 2 product. Results from 47 study participants are shown.

## DISCUSSION

During the 2006 – 2007 school year, a group of 50 students from Pawhuska Elementary used the Fast ForWord to Reading 2 product. Overall, students made statistically significant improvements in vocabulary skills. Half of the students used the protocol that called for 30 minutes of participation a day while the other half used the protocol that called for 48 minutes of participation a day. Statistical analyses reveal that the two groups made statistically similar gains, suggesting that the two protocols provide equivalent benefits. These findings demonstrate that, regardless of which daily protocol is used, within Pawhuska Elementary in the Pawhuska 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

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 in the Pawhuska School District who used either of two different protocols of the Fast ForWord to Reading 2 product improved their reading skills. These results suggest that using a 30-Minute or 48-Minute daily protocol of the Fast ForWord product can strengthen students' foundational skills and allow them to benefit more from the classroom curriculum.

	MANOVA	
	df	F
subtest	45	0.2
subtest x group	45	0.3
time	45	2.7
time x group	45	1.4
subtest x time	45	3.3
subtest x time x group	45	1.5

Table 3. A MANOVA showed that students who used the different Fast ForWord to Reading 2 protocols achieved similar gains. \*  $p < 0.05$

## Notes:

To cite this report: Scientific Learning Corporation. (2007). Improved Reading Skills by Students in Pawhuska School District who used Fast ForWord® to Reading 2, MAPS for Learning: Educator Reports, 11(20): 1-5.

## REFERENCES

- Lyon, G.R. (1996). Learning Disabilities. *The future of children: Special education for students with disabilities*. 6:54-76.
- MacGinitie, W. H., MacGinitie, R. K., Maria, K., Dreyer, L. G. (2000). *Gates-MacGinitie Reading Tests (GMRT) Fourth Edition*. Itasca, IL: Riverside Publishing.
- Merzenich MM, Jenkins WM, Johnston P, Schreiner CE, Miller SL, & Tallal P (1996). Temporal processing deficits of language-learning impaired children ameliorated by training. *Science*, 271, 77-80.
- Miller, S.L., Merzenich, M.M., Tallal, P., DeVivo, K., Linn, N., Pycha, A., Peterson, B.E., Jenkins, W.M., (1999). Fast ForWord Training in Children with Low Reading Performance, *Nederlandse Vereniging voor Lopopedie en Foniatrie: 1999 Jaarcongres Auditieve Vaardigheden en Spraak-taal*. (Proceedings of the 1999 Dutch National Speech-Language Association Meeting).
- Tallal, P (2000). The science of literacy: From the laboratory to the classroom. *Proceedings of the National Academy of Science*, 97(6), p. 2402-2404.
- Tallal, P (2004). Improving language and literacy is a matter of time. *Nature Reviews Neuroscience*, 5: p. 721-728.
- Tallal P, Miller SL, Bedi G, Byma G, Wang X, Nagarajan SS, Schreiner C, Jenkins WM, Merzenich MM (1996). Language comprehension in language-learning impaired children improved with acoustically modified speech. *Science* 271:81-84.