Improved Reading Achievement by Students in the Lafourche Parish Public Schools who used Fast ForWord® Products

MAPS for Learning: Educator Reports, 11(23): 1-5

ABSTRACT

Purpose: This study investigated the effects of the Fast ForWord products on the academic skills of elementary, middle, and high school 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 a criterion-referenced state assessment. **Participants:** Study participants were 4th, 8th and 10th grade students attending schools in the Lafourche Parish Public Schools in Thibodaux, Louisiana. **Materials & Implementation:** Following staff training on the Fast ForWord products, a group of students used the products during the 2005-2007 school years and had their reading and academic achievement assessed with the Louisiana Educational Assessment Program (LEAP) before and after Fast ForWord participation. **Results:** On average, students who used Fast ForWord products significantly improved in reading achievement and outperformed their district peers on the English Language Arts subtest of the LEAP. The percentage of students performing at a proficient level increased from 3% to 45% following Fast ForWord participation.

Keywords: Louisiana, public, elementary, middle, high schools, suburban district, observational study, Fast ForWord Language, Fast ForWord Middle & High School, Fast ForWord Language to Reading, Louisiana Educational Assessment Program (LEAP).

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 Lafourche Parish Public 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 Middle & High School, and Fast ForWord Language to Reading,) were used to evaluate the effectiveness of the optimal learning environment for improving the academic achievement of students in elementary through high school.

METHODS

Participants

Located in south Louisiana, the city of Thibodaux is 50 miles southwest of New Orleans. Thibodaux's school district, Lafourche Parish Public Schools, is a 28 school district serving a student population of 14,026. Approximately 71% of the students are Caucasian and 22% are African American. Fifty-eight percent of the students are identified as economically disadvantaged.

During the 2005-2006 and 2006-2007 school years, a group of 63 fourth, eighth, and tenth graders from 11 schools in the Lafourche Parish Public Schools used the Fast ForWord products and participated in the study reported here. Approximately 49% of the students were African American and 44% were Caucasian. Two-thirds of the students were receiving services for special education.

Student reading achievement was assessed with the Louisiana Educational Assessment Program (LEAP) before and after Fast ForWord product use. 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 Lafourche Parish Public Schools[1], Fast ForWord Language, Fast ForWord Middle & High School, and Fast ForWord Language to Reading, 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[2], Sweeps[3], and Trog Walkers[4]: 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 MacDonald's Flying Farm[2] and Streams[3]: Students hear a single syllable that is repeated several times, and then interrupted by a different syllable. Students must respond when they hear a change in the syllable. This exercise improves auditory processing, develops phoneme discrimination, and increases sustained and focused attention.

Phoneme Identification[2], IDs[3], Polar Cop[4], and Treasure in the Tomb[4]: 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* also develops sound-letter correspondence skills. *Treasure in the Tomb* also develops grapheme recognition.

Phonic Match[2], Matches[3], and Bug Out[4]: 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!* exercise develops skill with sound-letter correspondences as well as working memory.

Phonic Words[2] and Cards[3]: 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.

Language Comprehension Builder[2]: Students listen to a sentence that depicts action and complex relational themes. Students must match a picture representation with the sentence they just heard. This exercise develops oral language and listening comprehension, improves understanding of syntax and morphology, and improves rate of auditory processing.

Block Commander[2]: In Block Commander, a three-dimensional board is filled with familiar shapes that students select and manipulate. The students are asked to follow increasingly complex commands. This exercise increases listening comprehension, improves syntax, develops working memory, improves sound processing speed, and increases the ability to follow directions.

Stories[3] and Start-Up Stories[4]: Students follow increasingly complex commands, match pictures to sentences, and answer multiple-choice questions about stories that are presented aurally.

Assessments
Study participants were assessed with the Louisiana Educational Assessment Program (LEAP) before and after Fast ForWord participation. Data from the 2004 – 2005, 2005-2006 and 2006-2007 school years were available for analysis.

[1] Other Fast ForWord products in the district were used by fewer than 5% of the students in this study.
[2] Exercise from the Fast ForWord Language product.
[3] Exercise from the Fast ForWord Middle & High School product.
[4] Exercise from the Fast ForWord Language to Reading product.

Louisiana Educational Assessment Program (LEAP): The LEAP is a part of Louisiana's criterion referenced state testing program. The LEAP is administered each spring to students in grades 4 and 8. A version of it, the Graduate Exit Examination (GEE) is administered to students in tenth grade. The LEAP and GEE measure how well a student has mastered the state content standards. Students receive a scaled score and one of five achievement ratings ranging from Unsatisfactory to Advanced.

Analysis

Scores were reported in terms of scaled scores for the LEAP. Data were analyzed using paired t-tests. All analyses used a p-value of less than 0.05 as the criterion for identifying statistical significance. For purposes of comparison, scores were analyzed from students district-wide who did not use the Fast ForWord products and who had test data available from the years of interest.

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 2005-2006 and 2006-2007 school years, the Lafourche Parish Public 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.

Figure 1 shows the average daily progress through the Fast ForWord Language product exercises. This graph represents the learning curve of the students as they progress through the product. The other products used in this study, Fast ForWord Middle & High School and Fast ForWord Language to Reading, have similar learning curves. 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 products 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 Language	39	28	71	72%	94%	71%
Fast ForWord Middle & High School	9	28	72	69%	73%	59%
Fast ForWord Language to Reading	27	29	66	57%	92%	72%
Total	63	34	82	-	-	-

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.

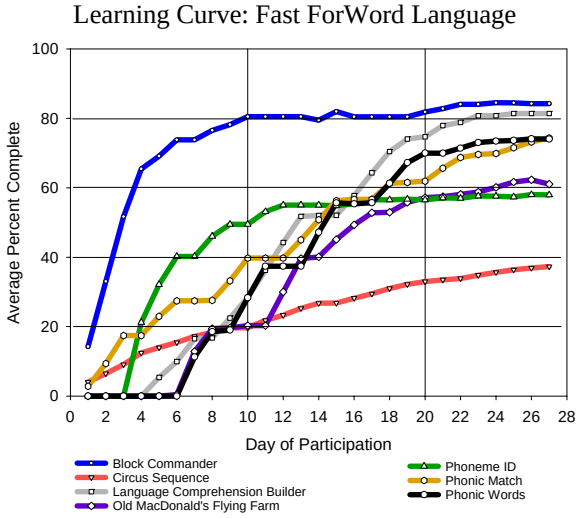

Figure 1. Average daily progress through the Fast ForWord Language product exercises. Results from 39 students are shown.

Assessment Results

Louisiana Educational Assessment Program (LEAP) 2005-2006: Scaled scores from the 2005 and 2006 administrations of the LEAP were available for analysis for 31 students who used the Fast ForWord products during the 2005 – 2006 school year. On average, students made significant gains in English Language Arts after Fast ForWord participation, improving 38 points in score compared to an average district improvement of 19 points (Table 2, Figure 2). In terms of achievement levels, the percentage of students performing at the proficient level rose from 3% to 45%.

Fast ForWord participants, overall, also outperformed their district peers on the Math subtest of the LEAP, making a 42 point gain versus a district improvement of 23 points (Table 3, Figure 4).

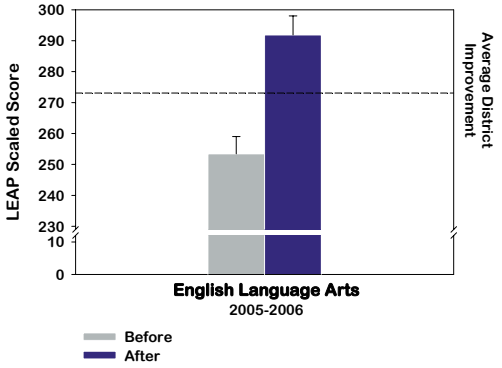

Figure 2. Students who used the Fast ForWord products gained, on average, 38 points on the LEAP. Results from 31 students are shown.

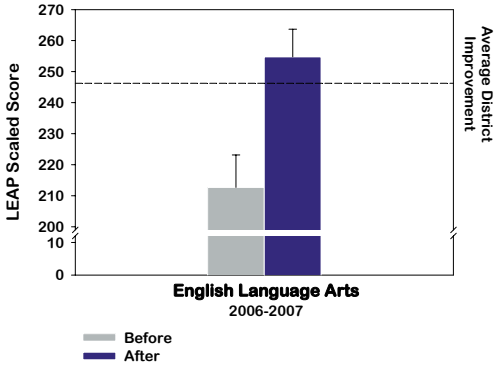

Figure 3. Following Fast ForWord participation, students improved an average of 42 points in reading achievement. Results from 32 students are shown.

Louisiana Educational Assessment Program (LEAP) 2006-2007: Thirty-two students had LEAP scaled scores available for analysis from the 2006 and 2007 administrations of the LEAP, and had used the Fast ForWord products during the 2006 – 2007 school year. Paired t-tests of the data showed that the average scores in English Language Arts improved significantly with a 42 point increase following use of the Fast ForWord products. On average, students who used Fast ForWord made greater gains than their district peers who did not use products (Table 2, Figure 3). In addition, the percentage of students performing at an achievement level of Basic or higher increased from 0% to 21% after Fast ForWord participation.

		Before		After		t-
LEAP ELA	n	Mean	SE	Mean	SE	statistic
2005-2006	31	253.4	5.57	291.8	6.17	6.85*
2006-2007	32	212.6	10.4	254.7	8.95	5.74*

*Table 2. On average, students significantly improved in reading achievement after Fast ForWord use. *p<0.05.*

Overall, participants significantly improved in the Math subtest after Fast ForWord use and made greater gains than district peers who did not participate in Fast ForWord (Table 3, Figure 5).

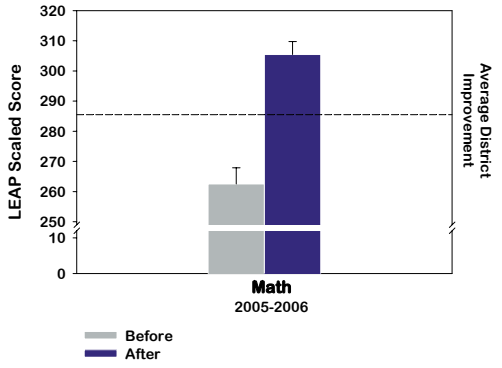

Figure 4. After Fast ForWord product use, students outperformed their district peers on the LEAP Math. Results from 31 students are shown.

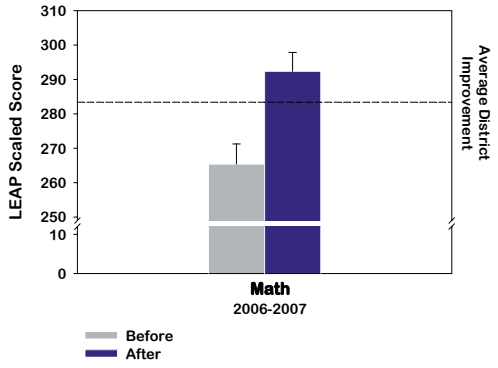

Figure 5. On average, students improved 26 points on the LEAP Math after Fast ForWord participation. Results from 35 students are shown.

	FFWD						District (no FFWD use)					
		Before		After		t-		Before		After		t-
LEAP Math	n	Mean	SE	Mean	SE	statistic	n	Mean	SE	Mean	SE	statistic
2005-2006	31	262.5	5.34	305.4	4.23	9.27*	322	265.3	1.94	289.0	2.27	9.38*
2006-2007	35	265.4	5.87	292.3	5.48	4.65*	135	267.6	3.04	286.2	2.75	5.63*

*Table 3. On average, students who used the Fast ForWord products made greater gains in math skills than students who did not use products. *p<0.05.*

DISCUSSION

During the 2005-2006 and 2006-2007 school years, elementary, middle, and high school students attending the Lafourche Parish Public Schools used the Fast ForWord products. Since the LEAP is not administered every year, the only students who had scores available for this study – those who took the LEAP in consecutive years – are those students who were retained. On average, the students made significant gains in academic achievement following Fast ForWord product use, with Fast ForWord participants outperforming their district peers (who also were taking the LEAP in consecutive years) in both English Language Arts and Math These findings demonstrate that, within the Lafourche Parish Public Schools, an optimal learning environment coupled with a focus on cognitive and early reading skills can help students attain a higher level of language and reading achievement.

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 Lafourche Parish Public Schools made significant gains in their reading and math achievement. These results support other studies showing that using the Fast ForWord products strengthens students' foundational skills and better positions them to benefit from the classroom curriculum.

Notes:

To cite this report: Scientific Learning Corporation. (2007). Improved Reading Achievement by Students in the Lafourche Parish Public Schools who used Fast ForWord® Products, MAPS for Learning: Educator Reports, 11(23): 1-5.

REFERENCES

Louisiana Department of Education (2005). *Louisiana Educational Assessment Program (LEAP)*. Baton Rouge, LA. Louisiana Department of Education.

Lyon, G.R. (1996). Learning Disabilities. *The future of children: Special education for students with disabilities.* 6:54-76.

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, 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.