Improved Reading Skills by Students in the Milford City School District who used Fast ForWord® Products

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ABSTRACT

Purpose: This study investigated the effects of the Fast ForWord products on the language and 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 study using nationally normed tests. **Subjects:** Study participants were elementary school students attending schools in the Milford City School District in Milford, Connecticut. **Methods & Implementation:** Students were evaluated with the Connecticut state assessment, Degrees of Reading Power (DRP), before Fast ForWord participation in the Fall of 2003 and after participation in the Spring of 2004. **Results:** On average, students made significant improvements in their reading achievement, as measured by the DRP, after using the Fast ForWord products.

Keywords: Connecticut, public elementary school, suburban district, observational study, Fast ForWord Language, Fast ForWord Language to Reading, Degrees of Reading Power (DRP).

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 Milford City 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 for improving reading achievement of students in a school setting. In this study, commercially available computer-based products (Fast ForWord Language and Fast ForWord Language to Reading) were used to evaluate the effectiveness of this approach at improving the reading achievement of students.

METHODS

Participants

The Milford City School District is a pre-Kindergarten through 12 grade district with 16 schools serving nearly 7,500 students. Approximately 89% of the students are Caucasian and 14.2% receive free or reduced price lunches. About 14% of the students have Individual Education Plans (IEPs).

During the 2003 – 2004 school year, 131 elementary school students from three schools in the Milford City School District (Calf Pen Meadow Elementary, Pumpkin Delight Elementary, Simon Lake Elementary) used the Fast ForWord products.

Students had their reading skills assessed with the Degrees of Reading Power (DRP) before and after Fast ForWord participation. Sixty-eight $3^{rd} – 5^{th}$ graders had DRP scores available for analysis. Forty-seven of these students (average grade 4.1) had DRP scores from before and after Fast ForWord use and were included in this study. 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 Language and Fast ForWord Language to Reading products are computer-based products that combine an optimal learning environment with a focus on early reading and cognitive skills. The products 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 the products, both help develop certain critical skills as detailed in the following exercise descriptions.

Circus Sequence[1] and Trog Walkers[2]: 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[1]: Students hear a single syllable that is repeated several times, and then interrupted by a different syllable. They 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[1], Polar Cop[2], and Treasure in the Tomb[2]: 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[1] and Bug Out[2]: 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[1]: 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[1]: 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[1]: 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.

Start-Up Stories[2]: Students follow increasingly complex commands, match pictures to sentences, and answer multiple-choice questions about stories that are presented aurally.

Assessments
Before and after Fast ForWord participation, students' reading performance was evaluated with the Degrees of Reading Power (DRP).

Degrees of Reading Power (DRP): The DRP is a group-administered nationally normed assessment that measures a student's ability to read and understand material. Students are given a DRP score that indicates the level of material that a student can read at a specified level of comprehension. The comprehension level used by the school district was p = 0.70 for students in fourth grade and below; a comprehension level of p = 0.75 was used for assessing students in the fifth grade. By converting DRP scores to Normal Curve Equivalents, scores can be compared across comprehension and grade levels.

The Institute for the Development of Educational Achievement, in accordance with the Reading First legislation, recognizes the DRP as an appropriate assessment for measuring improvement in the reading comprehension skills of children in early elementary school.

As part of the Connecticut Mastery Test, school personnel in Connecticut administer the DRP to evaluate the reading comprehension of the students.

Analysis
Data was analyzed using a t-test. All analyses used a p-value of 0.05 as the criterion for identifying statistical significance.

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[1] Exercise from the Fast ForWord Language product.
[2] Exercise from the Fast ForWord Language to Reading product.

RESULTS
Participation Level
the product. Product use is composed of content completed, days of use, and adherence to the chosen protocol (participation level). During the 2003 – 2004 school year, the Milford City School District chose to use the 100-Minute Fast ForWord Language Protocol that calls for students to use the product for 100 minutes a day, 5 days a week, for four to eight weeks.

All 47 students in the study used the Fast ForWord Language product; forty-one students also used the Fast ForWord Language to Reading product that has a protocol of 90 minutes a day, 5 days a week for four to eight weeks.

One hundred and thirty-one students from the Milford City School District used the Fast ForWord products during the 2003 – 2004 school year. Of these, 47 had DRP scores from before and after Fast ForWord use available for analysis. On average, these 47 students

Research conducted by Scientific Learning shows a relationship between product use and the benefits of completed 79% of the Fast ForWord Language product content and had a participation level of 68% during five weeks of use. They completed 78% of the Fast ForWord Language to Reading content and had a participation level of 70% over eight weeks of use. Detailed usage information by product is shown in Table 1.

Figures 1 and 2 show the average daily progress through the Fast ForWord Language and Fast ForWord Language to Reading exercises for all students who had DRP scores available. The final day shown on each graph 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
Fast ForWord Language	47	18	36	79%	68%
Fast ForWord Language to Reading	41	33	61	78%	70%

Table 1. Usage data showing the number of numbers of students who used each 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 and the participation level (percentage of 100 minutes per day, five days per week, that the students actually used the Fast ForWord Language product, or 90 minutes per day, five days per week, that students used the Fast ForWord Language to Reading product).
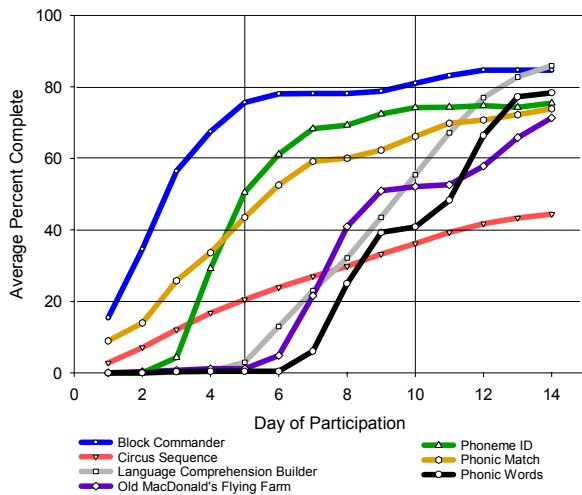

Figure 1. Average daily progress through the Fast ForWord Language exercises. Results from 47 students are shown.
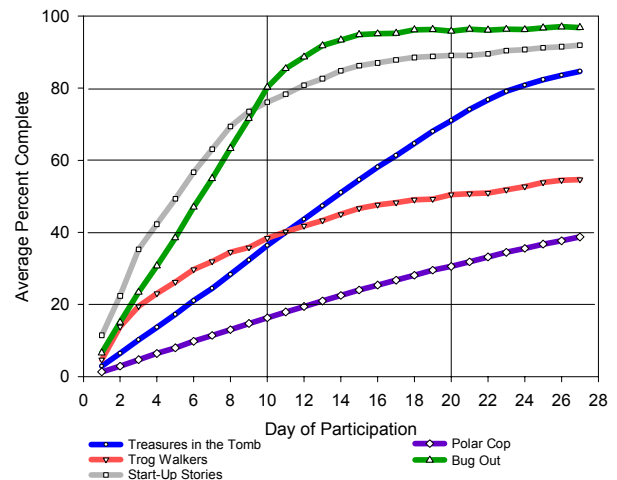

Figure 2. Average daily progress through the Fast ForWord Language to Reading exercises. Results from 41 students are shown.

Assessment Results
Degrees of Reading Power (DRP): The DRP was used to evaluate the reading skills of students before and

after Fast ForWord participation. Student data were reported in terms of DRP scores—a scaled score that varies from 0 to 100. The scores measure the

student's reading ability at a given comprehension level and correspond to the level of material appropriate for achieving that comprehension level. Scores were converted to Normal Curve Equivalents (NCE) to allow comparisons across grades and comprehension levels.

On average, before using the Fast ForWord products, students had a NCE of 36.9, which corresponds to a student in the 26th percentile. After participation, the group of students significantly improved their scores to 42.4, an increase to the 35th percentile (Table 2, Figure 3).

Before		After		
Mean	SE	Mean	SE	t-statistic
36.9	2.1	42.4	1.8	3.5*

*Table 2. NCE scores on the DRP from before and after Fast ForWord participation showed that students, on average, made significant improvements. *p<0.05*
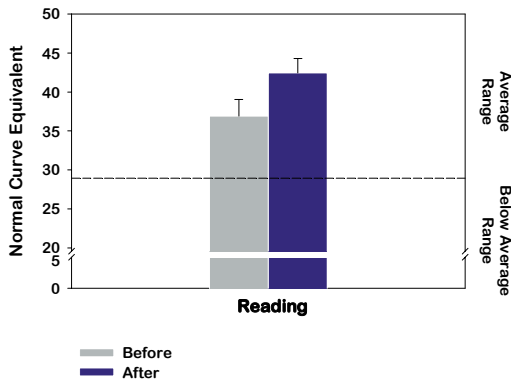

Figure 3. On average, after Fast ForWord participation, students made significant improvements in their reading ability.

DISCUSSION
During the 2003 – 2004 school year, students in the Milford City School District used the Fast ForWord products. Students showed significantly improved reading skills after Fast ForWord participation. These findings demonstrate that, within the Milford City School District, an optimal learning environment coupled with a focus on cognitive and early reading skills can help students attain a higher level of academic achievement.

CONCLUSION
Cognitive and learning skills are critical for all students, impacting their ability to benefit from instruction, follow instructions, and participate in class discussions. Strong linguistic skills also provide a critical foundation for building reading and writing skills. After using the Fast ForWord products, students in the Milford City School District significantly improved their reading achievement. This suggests that using the Fast ForWord products strengthened the students' foundational skills and helped them benefit more from the classroom curriculum.

Notes:

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