

Improved Reading Skills by Students in the Eldred Central 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 reading skills of elementary and junior and senior 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 nationally normed assessments. **Participants:** Study participants were students attending the elementary or junior/senior high school in the Eldred Central School District of Eldred, New York. **Materials & Implementation:** Following staff training on the Fast ForWord products, a group of students used the products during the 2005-2006 school year. Student reading skills were assessed with the STAR Reading assessment before and after Fast ForWord participation. **Results:** Overall, struggling students who used Fast ForWord products improved their performance on tests of reading with those who completed two products showing greater gain on tests of reading than those who completed just one. For students who completed two products, average gain in reading grade level was 11 months, a gain corresponding to an improvement from the 26th percentile to the 34th percentile.

Keywords: New York, public, elementary, junior/senior high, rural, observational study, Fast ForWord Language, Fast ForWord Middle & High School, Fast ForWord Language to Reading, STAR Reading.

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 Eldred Central 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 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 this approach for improving the reading achievement of elementary and junior and senior high school students.

METHODS

Participants

The town of Eldred is located in Sullivan County, New York, on Route 55, approximately 90 miles northwest of New York City.

The Eldred Central School District is a two school district with an approximate student population of 700 in Kindergarten through twelfth grade. Both schools in the district, George Ross Mackenzie Elementary and Eldred Junior/Senior High, chose to participate in the study reported here.

George Ross Mackenzie Elementary serves grades Kindergarten through sixth, and Eldred Junior/Senior High is a 7th through twelfth grade school. In both schools, the majority of students (92%) are Caucasian.

Approximately 19% of the students at George Ross Mackenzie are eligible for free or reduced price lunches; 12% of the students at Eldred Junior/Senior High are eligible.

During the 2005-2006 school year, a group of 43 struggling students were selected by their teachers to use the Fast ForWord products. This analysis includes the 42 students with pre- and post-participation data available. Students were in 1st through 4th grade or 7th through 10th grade with an average grade level of 5.7. Before and after Fast ForWord product use, student reading ability was evaluated with the STAR Reading assessment. 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 Eldred Central School District, 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 Sequence¹, Sweeps², and Trog Walkers³: Students hear a series of short, non-verbal tones. Each tone represents a different fragment of the frequency spectrum used in spoken language.

¹ Exercise from the Fast ForWord Language product.

² Exercise from the Fast ForWord Middle & High School product.

³ Exercise from the Fast ForWord Language to Reading product.

Students are asked to differentiate between these tones. The exercises improve working memory, sound processing speed, and sequencing skills.

Old MacDonald's Flying Farm¹ and Streams²: 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 Identification¹, IDs², Polar Cop³, and Treasure in the Tomb³: 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 Match¹, Matches², and Bug Out³: 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 Words¹ and Cards²: 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 Builder¹: 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.

*Stories*² and *Start-Up Stories*³: Students follow increasingly complex commands, match pictures to sentences, and answer multiple-choice questions about stories that are presented aurally.

Assessments

Student reading skills were assessed with the STAR Reading assessment before and after Fast ForWord participation.

STAR Reading: 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 grades 1 through 12.

Analysis

Scores were reported in terms of normal curve equivalents (NCEs) and grade equivalents. NCEs are grade- and season-corrected such that they show a student's performance relative to peers in the same grade, and at the same time of the year. NCEs were analyzed using paired t-tests. 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 2005-2006 school year, the Eldred Central School District chose to use the 48- and 50-Minute protocols for the Fast ForWord products. This protocol 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 information is shown in Table 1.

Most students started with either the Fast ForWord Language or Fast ForWord Middle & High School product, and the majority of participants also used the Fast ForWord Language to Reading product. Figure 1 shows the average daily progress through the Fast ForWord Language to Reading product exercises. This graph represents the learning curve of the students as they progress through the product. Similar learning curves are available for the other products used in this study, Fast ForWord Language and Fast ForWord Middle & High School. 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	17	29	57	78%	99%	80%
Fast ForWord Middle & High School	25	35	66	85%	92%	74%
Fast ForWord Language to Reading	36	38	95	68%	93%	62%
Total	42	66	144	-	-	-

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.

Learning Curve: Fast ForWord Language to Reading

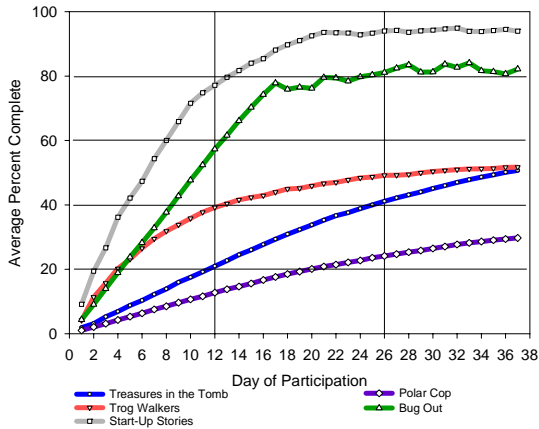


Figure 1. Average daily progress through the Fast ForWord Language to Reading product exercises. Results from 36 students are shown.

Assessment Results

STAR Reading: Data were reported in terms of normal curve equivalents and grade equivalents. Forty-two students had pre- and post-Fast ForWord STAR Reading scores available for analysis. A paired t-test of the NCE scores showed an improvement in reading skills after Fast ForWord participation (Table 2). In terms of grade equivalents, students gained six months in reading grade level (Figure 2).

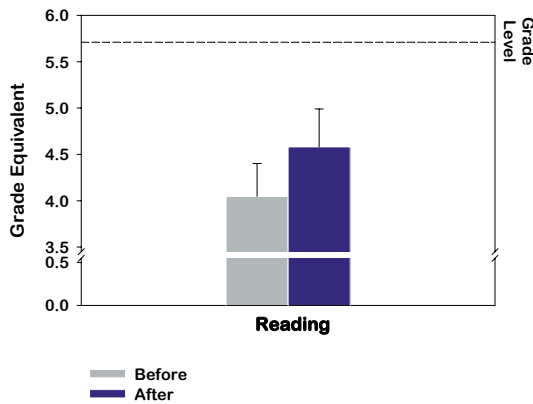


Figure 2. Students who used the Fast ForWord products gained, on average, 6 months in reading skill. Results from 42 students are shown.

	n	Before		After		t-statistic
		Mean	SE	Mean	SE	
STAR Reading	42	28.4	2.36	31.2	2.70	1.56

Table 2. On average, students improved in reading ability after Fast ForWord use.

Along with the STAR Reading data, the Eldred Central School District included information on which Fast ForWord products a participant had completed. To evaluate the impact of product completion on student reading ability, a separate analysis was performed using the NCE scores from students who had completed at least one Fast ForWord product.

Forty students had data available for analysis. The average grade-level of the students was 5.8. Student data were separated into three groups depending on their product completion as defined by the Eldred Central School District. Group 1 included students who completed only one product and students who completed their first product and completed less than 50% of the Fast ForWord Language to Reading product. Group 2 students completed their first product and more than 50% of the Fast ForWord Language to Reading product but did not complete the second product. Students in Group 3 completed their first product and the Fast ForWord Language to Reading product.

Paired t-tests showed all three groups improved in reading ability after Fast ForWord participation (Table 3). On average, students in Group 3 who completed their first product and the Fast ForWord Language to Reading product had the greatest gain followed by students in Group 2 who completed their first product but not their second product (Fast ForWord Language to Reading). Figure 3 shows the improvements for each group in terms of grade equivalents.

Group	Completed	n	Before		After		t-statistic
			Mean	SE	Mean	SE	
1	One product and less than 50% of second product	7	26.8	4.32	26.5	3.64	0.17
2	One product and more than 50% of second product	23	26.4	3.15	30.5	3.60	1.48
3	Two products	10	36.5	5.29	41.4	5.49	1.68

Table 3. On average, following Fast ForWord participation, students improved in reading skills, with students who completed both a Fast ForWord Language product and the Fast ForWord Language to Reading product making the greatest gains.

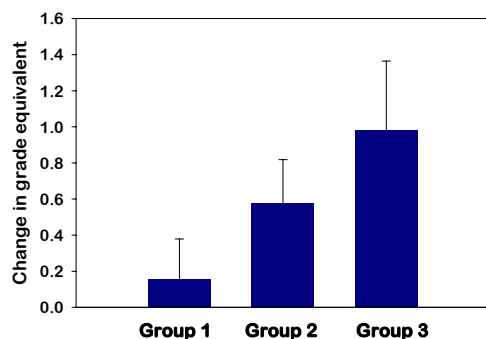


Figure 3. The more content students completed, the greater the impact on their reading scores. Group 1 students completed one product and not more than 50% of a second product; Group 2 students completed one product, and more than 50% of a second product; Group 3 students completed two products. Results from 40 students are shown.

DISCUSSION

During the 2005-2006 school year, elementary and middle school students in the Eldred Central School District used the Fast ForWord products and participated in the study reported here. The School District was particularly interested in evaluating the impact of successfully completing Fast ForWord products. A few of the students had not yet completed the Fast ForWord Language or Middle & High School product or had completed less than 50% of the product at the time of post-testing. An analysis focusing on the scores of students who completed the content showed that, on average, students who completed the Fast ForWord products had significant improvements in reading ability, and that their improvements were greater than those of the students who did not complete the Fast ForWord products. For those who completed two products (Fast ForWord Language or Fast ForWord Middle & High School followed by Fast ForWord Language to Reading), reading grade-level improved almost one year, corresponding to a gain from the 26th percentile to the 34th percentile.

The students in the study were struggling readers who were reading at a level nearly two years below grade-

level. These findings demonstrate that, within the Eldred Central School District, an optimal learning environment coupled with a focus on cognitive and early reading skills can help struggling 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, struggling readers in the Eldred Central School District made significant gains in their reading ability. This suggests 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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