Improved Reading Achievement by Students in the Bay District Schools in Florida who used Fast ForWord® Products

ABSTRACT

Purpose: This study investigated the effects of the Fast ForWord products on the reading skills of students who attended Surfside Middle School in Bay County, Florida and who used the products within the curriculum in a school setting. **Study Design:** The design of the study was a single school case study using nationally normed tests of reading. **Subjects:** Study participants were sixth through eighth graders in the Bay District Schools in Florida who had their skills evaluated before and after using Fast ForWord products. **Materials & Implementation:** Following staff training on the Fast ForWord products, students at Surfside Middle School used Fast ForWord products. Before and after Fast ForWord participation, student performance was evaluated by examining progress on the Florida Comprehensive Assessment Test (FCAT) and on the STAR Reading assessment. Dependent t-tests were used to compare how the study participants performed before and after using the Fast ForWord products. **Results:** On average, the students who used Fast ForWord products made significant improvements in reading achievement. In addition, the participants' Developmental Scale Scores on the FCAT increased nearly twice as much year over year, compared to students statewide in comparable grades.

Keywords: Florida, middle school, suburban district, observational study, Fast ForWord Middle & High School, Fast ForWord Language to Reading, Florida Comprehensive Assessment Test (FCAT), STAR Reading Assessment.

INTRODUCTION

Numerous research studies have shown that cognitive and oral language skills are underdeveloped 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 Bay District Schools in Florida were interested in a learning environment with a focus on reading and cognitive skills as a way for improving the reading skills of their students in a school setting. In this study, commercially available computer-based products (Fast ForWord Language to Reading and Fast ForWord Middle & High School) were used to evaluate the effectiveness of this approach at improving the reading skills of students.

METHODS

Participants

The Bay District Schools comprise a suburban district located in northwestern Florida, on the coast of the Gulf of Mexico. Public schools in Bay County serve about 27,000 students in pre-kindergarten through grade 12.

Surfside Middle School, one of the Bay District Schools, serves over 1,100 students in 6th – 8th grades.

During the 2003 – 2004 school year 130 students from Surfside Middle School were selected by teachers and school administrators to use Fast ForWord products. This report is about the 36 students who used the Fast ForWord products for 11 or more days, started using the products prior to January, 2004, and had their skills assessed before and after participation. By evaluating only students who started in the Fall, 2003, students completed the products prior to the FCAT post-assessment in March. The group of 36 students consisted of eleven sixth-graders, twelve seventh-graders, and thirteen eighth-graders.

Implementation

Educators at Surfside Middle School were trained in current and established findings on the neuroscience of 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 product candidates; 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 product.

Materials

Fast ForWord products, computer-based products combining an optimal learning environment with a focus on early reading and cognitive skills, were used in conjunction with the school curriculum. The specific

products used by Surfside Middle School students were Fast ForWord Language to Reading and Fast ForWord Middle & High School. These products include five to seven exercises designed to build skills that are critical for reading and learning, such as auditory processing, memory, attention, and language comprehension.

Sweeps[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.

Streams[1]: 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.

IDs[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.

Matches[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.

Cards[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.

Stories[1] and Start-Up Stories[2]: Students follow increasingly complex commands, match pictures to

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[1] Exercise from the Fast ForWord Middle & High School product.
[2] Exercise from the Fast ForWord Language to Reading product.

sentences, and answer multiple-choice questions about stories that are presented aurally.

Assessments
To determine the impact of using Fast ForWord products, staff within the Bay District Schools looked to results from tests that were administered before and after students used Fast ForWord products: the Florida Comprehensive Achievement Test (FCAT) and the STAR Reading assessment. Both assessments are administered yearly by school personnel.

Florida Comprehensive Assessment Test (FCAT): The reading portion of the FCAT, administered every March to students in $3^{rd} – 10^{th}$ grade, is designed to assess student achievement of the high-order cognitive skills represented in the Sunshine State Standards (SSS) for Reading. This is a criterion-referenced test. Student performance on the FCAT can be reported in terms of Level, or in terms of a Developmental Scale Score. Levels range from 1 (student showed little success meeting basic skills for their grade level) and 2 (student had limited success with the challenging content of the test) up to 5 (student successfully answered the most challenging parts of the test including many of the hardest questions).

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. Student scores can be reported in a variety of ways including grade equivalent scores.

For the analyses, the FCAT Reading performance was reported in terms of Level achieved in 2003 and 2004, as well as the change in Developmental Scale Score between 2003 and 2004. Developmental Scale Scores for each year were not available for analysis. STAR Reading assessment results were reported in terms of grade equivalents.

Analysis
Levels and grade equivalent scores for the students in the study were compared using dependent t-tests. In addition, average improvement in Developmental Scale Score was calculated and compared to statewide improvements for students in corresponding grades. Statistical analyses used a p-value of 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). The Fast ForWord protocols used by the district called for students to use the products 90 minutes per day, five days a week for four to eight weeks.

One hundred thirty students from Surfside Middle School were selected to use Fast ForWord products during the 2003 – 2004 school year. The majority of students (92) used both the Fast ForWord Middle & High School

product and the Fast ForWord Language to Reading product. On average, students spent 30 days using Fast ForWord products: the Fast ForWord Middle & High School product was used for an average of 24 days, and the Fast ForWord Language to Reading product was used for an average of 11 days. Detailed usage information for the district is shown in Table 1. Figures 1 and 2 show the average daily progress through the Fast ForWord

exercises for the students who participated at least 5 or more days and had FCAT or STAR Reading scores available. The final day shown on each chart 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.

Product	Number of Students	Average Days of Product Use	Average Number of Calendar Days	Average Overall Percent Complete	Average Participation Level
Middle & High School	113	24	41	71%	66%
Language to Reading	105	11	18	40%	62%

Table 1. Usage data showing the number of students who used the Fast ForWord Middle & High School and Fast ForWord Language to Reading products. Also shown are the group averages for the number of days they used the products, the calendar days between start and finish, the percentage of content they covered, and their participation level (the percentage of 90 minutes per day, five days per week, that the students actually used the Fast ForWord products).
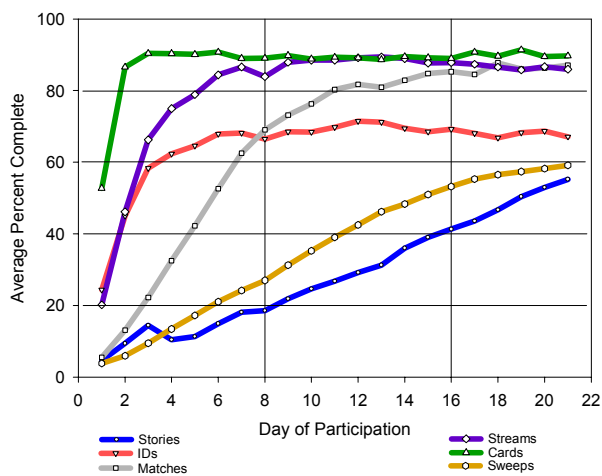

Figure 1. Average daily progress of students through the Fast ForWord Middle & High School product. Results from 38 students are shown.
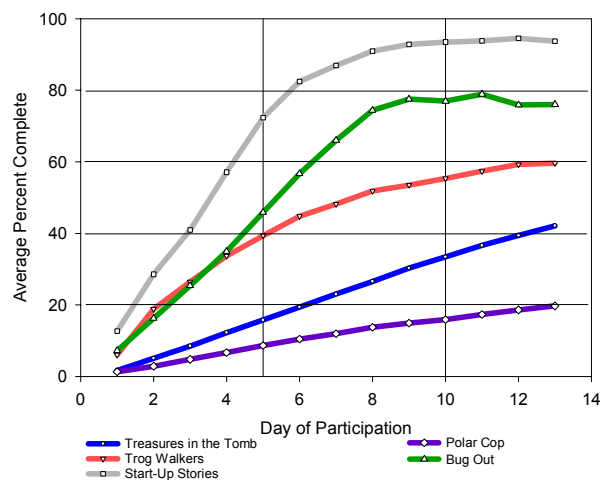

Figure 2. Average daily progress of students through the Fast ForWord Language to Reading product. Results from 20 students are shown.

Assessment Results

Florida Comprehensive Assessment Test:
Students made substantial improvements in their FCAT scores as determined by change in their Developmental Scale Score (DSS). On average, students who used Fast ForWord products achieved a 180.1 point change in their DSS, while a weighted calculation based on statewide scale scores for students in the same grades as the students in the study, showed a statewide change of 99.1 (Figure 3).

In addition to reporting the change in DSS, FCAT Levels for reading for 2003 and 2004 were reported for study participants. Initially, only 6% of the students were at a Level 2 (student had limited success with the challenging content of the test), while 92% were at Level 1 (student showed little

success meeting basic skills for their grade level). After using Fast ForWord products, the number of students at Level 2 had increased to 28%, while the number remaining at Level 1 had decreased to 69%. A dependent t-test showed that, after using the Fast ForWord products, the participants made statistically significant improvements (Table 2), with the group's mean score increasing from 1.11 to 1.33.

STAR Reading: Before using the Fast ForWord products, students at Surfside Middle School were, on average, reading at a low 4th grade reading level. The students' actual grade level was 7.1. On average, after participating on the Fast ForWord products, students showed significant improvements in their reading skills, gaining nine months of achievement in the year between assessments (Figure 4 and Table 2).

		Before (2003)		After (2004)		
	n	Mean	SE	Mean	SE	t-statistic
FCAT level	36	1.11	.066	1.33	.089	-2.3*
STAR	34	4.3	.23	5.0	.23	-4.6*

*Table 2. Overall, students who used the Fast ForWord product made statistically significant gains in reading, as measured by the reading portion of the FCAT and STAR Reading. *p < 0.05.*
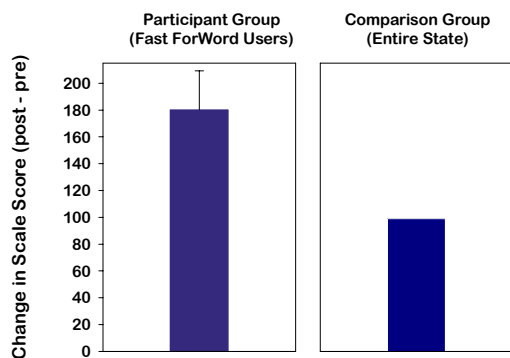

Figure 3. In this study, the reading skills of 36 students were evaluated using the FCAT. The results show that improvement achieved by the Fast ForWord participants nearly doubled that achieved statewide by students in comparable grades.
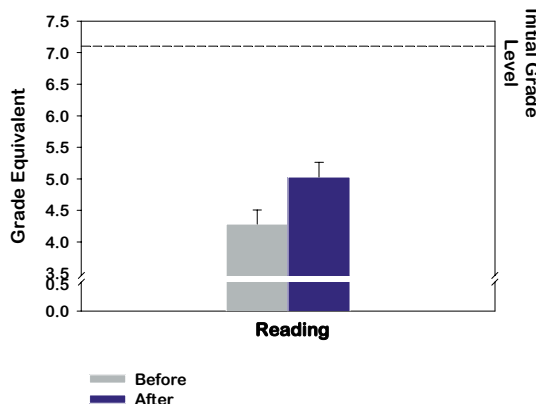

Figure 4. In this study, the reading skills of 34 students were evaluated using the STAR Reading test. The participants, who were reading well below their grade level, achieved significant improvements.

DISCUSSION

One hundred thirty students from Surfside Middle School were selected to use Fast ForWord products during the 2003 – 2004 school year. The students were academically at-risk with few of the students having success meeting the basic skills expected at their grade level. And yet, the Developmental Scale Scores from FCAT Reading Assessment of the Surfside Middle School students' in the study reflect significant improvements in the reading skills that, year-over-year, nearly doubled the improvement of their peers. While the improvement in Level is also significant, the real effects are hidden by the extremely low levels at which many of the students started – they achieved significant improvements, and there is room for more.

CONCLUSION

Scores from before and after Fast ForWord participation show that, on average, students made significant increases in their reading abilities. These results support previous studies demonstrating that using the Fast ForWord products strengthens students' foundational skills and helps them benefit more from the classroom curriculum.

Notes:

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