Improved Reading Skills by Students in the United Independent School District who used Fast ForWord® Products

ABSTRACT

Purpose: This study investigated the effects of the Fast ForWord products on the reading skills of 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 tests. **Participants:** Study participants were ninth through twelfth graders who were receiving services for special education and were attending one of two high schools in the United Independent School District in Laredo, Texas. **Materials & Implementation:** Following staff training on the Fast ForWord products, a group of students used the products during the Fall of the 2004 – 2005 school year. The Gates-MacGinitie Reading Tests (GMRT) were used to assess student reading ability before and after participation on the Fast ForWord products. **Results:** On average, students made significant improvements in their reading skills, gaining an average of nine months in reading grade-level over four months of Fast ForWord use.

Keywords: Texas, high school, urban district, observational study, Special Education, Fast ForWord Middle & High School, Fast ForWord Language to Reading, Gates-MacGinitie Reading Tests (GMRT).

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 United Independent 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 the reading skills of low-performing students in a school setting. In this study, commercially available computer-based products (Fast ForWord Middle & High School and Fast ForWord Language to Reading) were used to evaluate the effectiveness of this approach for improving the reading ability of high school students.

METHODS

Participants

Known as the "Gateway to Mexico" because of its location on the north bank of the Rio Grande River, Laredo, Texas, is the second fastest growing city in the United States. The United Independent School District in Laredo reflects this rapid growth with a student population of over 32,000 in 37 schools. Two of the high schools in this district, Lyndon B. Johnson and United High School, chose to use the Fast ForWord products in the Fall of the 2004 – 2005 school year and took part in this study.

Lyndon B. Johnson serves over 1,000 students in grades nine through twelve. Approximately 99% of the students are Hispanic and 92% receive free or reduced price lunches. United High School has a student population of over 2,000 in ninth through twelfth grade. About 95% of the students are Hispanic and 41% receive free or reduced price lunches.

A total of 32 students from the two schools participated in this study. The students were receiving services for special education. They were in the ninth to twelfth grades (average of eleventh grade) and had their English reading ability assessed with the Gates-MacGinitie Reading Tests (GMRT) before and after participating on the Fast ForWord products. 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 Middle & High School 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 six 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, both help develop certain critical skills as detailed in the following exercise descriptions.

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

Assessments

Students were evaluated with the Gates-MacGinitie Reading Tests (GMRT) before and after Fast ForWord participation. The tests were administered by school district personnel.

Gates-MacGinitie Reading Tests, Fourth Edition (GMRT): The fourth edition of the GMRT is designed to provide an assessment of reading achievement. It contains Levels ranging from PR (pre-Reading designed for Kindergarten and beginning first grade students) to AR (Adult Reading, designed for colleges and adult education programs). Level 2 of the GMRT, which provides a general assessment of early reading achievement for students below third grade, contains three subtests: Word Decoding, Word Knowledge and Comprehension.

Word Decoding assesses a student's ability to recognize words. Word Knowledge evaluates reading vocabulary and Comprehension assesses the ability to understand extended written text.

Analysis

Scores were reported in terms of grade equivalents. Data were analyzed using a repeated measures analysis of variance (ANOVA) and dependent 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 level). During the Fall of the 2004 – 2005 school year, the United Independent School District chose to use a combination of the 48-

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[1] Exercise from the Fast ForWord Middle & High School product.

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

and 90-Minute Fast ForWord Middle & High School Protocols and the 50- and 90-Minute Fast ForWord Language to Reading Protocols. These protocols call for students to use the products for 48, 50, or 90 minutes a day, five days per week for four to twelve weeks. All of the students used the Fast ForWord Middle & High School product; 11 also used the Fast ForWord Language to Reading product. Most students used the products for approximately three months, from September until December of 2004. A few students continued using the products until March and April of 2005. On average, students used the Fast ForWord Middle & High School product for 51 days,

completing 65% of the product content. Detailed product use by product is shown in Table 1.

Figures 1 and 2 show the average daily progress through the Fast ForWord Middle & High School and Fast ForWord Language to Reading product exercises for students who had scores available for analysis. 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
Fast ForWord Middle & High School	32	51	108	65%	65%
Fast ForWord Language to Reading	11	23	131	44%	32%

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 and the participation level.
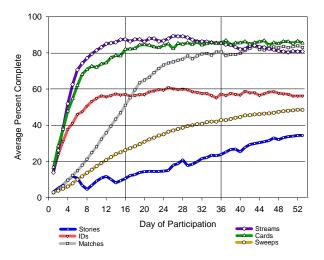

Figure 1. Average daily progress through the Fast ForWord Middle & High School product exercises. Results from 32 students are shown.

Figure 2. Average daily progress through the Fast ForWord Language to Reading product exercises. Results from 11 students are shown.

Assessment Results

Students in this study were in ninth to twelfth grade with most students in the eleventh grade. Due to the low reading skills of these students, they were assessed with Level 2 of the Gates-MacGinitie Reading Tests (GMRT), which is designed to provide a general assessment of early reading achievement in students under third grade. Level 2 of the GMRT has three subtests: Comprehension, Word Decoding and Word Knowledge. Students began Fast ForWord product use in September of 2004. Most had completed the products by January but a few continued to participate until March and April of 2005
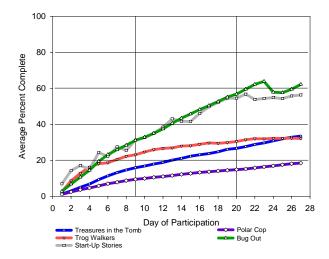
for an average of four months of product use. Of the 32 students who had GMRT scores reported, several were missing scores from either the subtests or the overall GMRT reading score. Therefore, 25 students had GMRT subtest scores and 31 students had overall GMRT scores from both before and after starting Fast ForWord participation available for analysis.

Gates-MacGinitie Reading Tests (GMRT): Overall, the students, who were at an average grade level of 10.8, were performing at a low second grade level (2.3) before Fast ForWord use. The group of students gained three months in reading ability after using the

Fast ForWord products (Figure 3). An ANOVA indicated that there was a significant difference in the improvements on the GMRT subtests. To determine if the improvements were due to any particular subtest, post hoc t-tests were performed and showed that
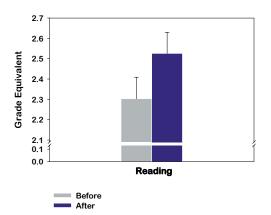
students made significant improvements in grade-level on two of the three subtests of the GMRT, gaining two months in Word Knowledge and over nine months in Comprehension (Table 2, Figure 4).
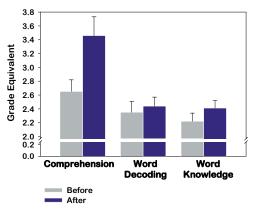

Figure 3. On average, students made significant improvements after participating on the Fast ForWord products. Results from 31 students are shown.

Figure 4. Students improved their reading skills by as much as nine months after Fast ForWord use. Results from 25 students are shown.

	n	Before		After		t-statistic	ANOVA f		
		Mean	SE	Mean	SE		Subtest	Time	Time x Subtest
Comprehension	25	2.6	0.1	3.4	0.2	3.1*			
Word Decoding	25	2.3	0.1	2.4	0.1	1.2			
Word Knowledge	25	2.2	0.1	2.4	0.1	2.9*			
							12.6*	15.5*	3.7*

*Table 2. Students, on average, significantly improved their reading ability after Fast ForWord use, gaining as much as nine months after participation. *p<0.05.*

DISCUSSION

During the Fall of the 2004 – 2005 school year, high school students in the United Independent School District used the Fast ForWord products. Students made significant improvements in their reading ability, with average improvements of nine months on Comprehension. Given past improvements by these students, who were performing nine years below their average grade-level, gains of three months in reading ability from just the Fall participation on the Fast ForWord products is a dramatic improvement in their acquisition rate of reading ability. Nine months of improvement in Comprehension is extraordinary when considering the students' low reading performance before Fast ForWord participation and that most students used the products for just four months. These findings demonstrate that, within the United Independent School District, an optimal learning environment coupled with a focus on cognitive and early reading skills can help students attain a higher level of reaching achievement.

CONCLUSION

Language and reading 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 Fast ForWord use, students in the United Independent School District made significant gains in their reading skills. This suggests that using the Fast ForWord products strengthened the students' foundational skills and helped them benefit more from the classroom curriculum.

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