Improved Reading Skills by Students at Bridges Academy who used Fast ForWord® and Reading Assistant™ Products

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ABSTRACT

Purpose: This study investigates the effects of the Fast ForWord and Reading Assistant products on the reading skills of elementary, middle, and high school level students who used the products within the curriculum in a school setting.

Results: Following use of a combination of the Fast ForWord family of products and Scientific Learning® Reading Assistant software, the study group made significant gains in reading ability. On measures of Word Identification, Word Attack, and Passage Comprehension, study participants averaged more than a year's improvement in a three month period.

Study Design: The design of this study was a single-school case study using nationally normed assessments.

Participants: Study participants were 17 students in second grade through tenth grade who were attending Bridges Academy, a school that serves students with specific learning disabilities in Winter Springs, Florida.

Materials & Implementation: Following staff training on the Fast ForWord and Reading Assistant products, a group of students used the products during the winter, spring, and/or summer of 2008. Their reading abilities were assessed before and after Fast ForWord and Reading Assistant participation with tests from a battery of standardized, nationally normed test: the Woodcock Reading Mastery Tests-Revised (WRMT-R).

Keywords: Florida, elementary, middle, high school, suburban, observational study, Fast ForWord Language, Fast ForWord Language to Reading, Fast ForWord Literacy, Fast ForWord Literacy Advanced, Fast ForWord Reading Level 1, Fast ForWord Reading Level 2, Fast ForWord Reading Level 3, Fast ForWord Reading Level 5, Reading Assistant, Woodcock Reading Mastery Tests-Revised (WRMT-R).

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).

Further research has demonstrated that the use of an optimal learning environment with a focus on reading and cognitive skills not only benefits the auditory processing and language skills of school children who have specific language impairments, but can benefit the reading achievement of a wide range of students.

During the winter, spring, and/or summer of 2008, Bridges Academy evaluated the impact of adding Scientific Learning Reading Assistant software to the school's existing Fast ForWord implementation. They found that students using Fast ForWord products along with Reading Assistant made significant improvements in reading skills as measured by the Woodcock Reading Mastery Tests-Revised (WRMT-R) to evaluate the students' skills. During the study period, all participants used Reading Assistant and one or more of the Fast ForWord products.

METHODS

Participants

Founded in 2003 as a school for students with learning disabilities, Bridges Academy offers educational services using a combination of state-of-the-art technology, research-proven curriculum methods, and hands-on learning strategies.

Between December of 2007 and September of 2008, 17 students attending Bridges Academy participated in this study. This group included students from grades 2 through 10 (grade level at the beginning of the study). Of the 17 participants, 12 had been diagnosed with one or more learning disorders including attention deficit disorder (ADD), auditory processing disorder (APD), autism, dyslexia, Kleinfeldter's syndrome, speech/language impairment (SLI), and specific learning disability (SLD).

Before and after Fast ForWord and Reading Assistant participation, the students were assessed with three tests from the Woodcock Reading Mastery Tests-Revised (WRMT-R). School personnel administered the tests 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 importance of guided oral reading practice for building reading fluency; 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 and Reading Assistant 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. Each product includes several exercises designed to build cognitive skills critical for all learning, such as attention and memory. These exercises simultaneously develop academic skills critical for reading, such as English language conventions, phonemic awareness, vocabulary, and comprehension.

Scientific Learning Reading Assistant is a computer-based tutor for guided oral reading. Combining advanced speech recognition technology with research-based interventions, Reading Assistant helps elementary and secondary students strengthen their reading fluency, vocabulary and comprehension.

Some of the primary skills developed by these products are outlined in Table 1. More detailed descriptions of the exercises and learning modes within each product can be found online at http://www.scientificlearning.com.

Product Name \ Primary Skills	Listening Accuracy & Auditory Sequencing	Auditory Word Recognition	English Language Conventions	Following Directions	Listening Comprehension	Phonological Skills / Phonemic Awareness	Phonics / Word Analysis	Fluency	Vocabulary	Reading Comprehension
Fast ForWord Language	●	●	●	●		●			●	
Fast ForWord Language to Reading	●		●	●	●	●	●		●	
Fast ForWord Literacy	●	●	●	●	●	●			●	
Fast ForWord Literacy Advanced	●		●	●	●	●	●		●	
Fast ForWord Reading Level 1					●	●	●	●	●	●
Fast ForWord Reading Level 2					●	●	●	●	●	●
Fast ForWord Reading Level 3						●	●	●	●	●
Fast ForWord Reading Level 5						●	●	●	●	●
Reading Assistant								●	●	●

Table 1: The Fast ForWord and Reading Assistant products work on numerous cognitive and early reading skills. The primary skills focused on by each product are noted in the table.

Assessments
Before and after Fast ForWord participation, student reading skills were assessed with the Woodcock Reading Mastery Tests-Revised (WRMT-R).

Woodcock Reading Mastery Tests-Revised (WRMT-R):
The Woodcock Reading Mastery test is a standardized, individually administered measure of several important aspects of reading ability. This comprehensive battery is normed for children from kindergarten through college level, as well as adults. The following tests were used in this study:

- **Word Identification** measures skill in reading isolated words.
- **Word Attack** measures skill in applying phonemic decoding and structural analysis to unfamiliar words.
- **Passage Comprehension** measures skill in reading a short passage and identifying a missing key word.

Analysis
Scores were reported in terms of standard scores and grade equivalents for the Woodcock Reading Mastery Tests-Revised (WRMT-R). Standard scores were used for all analyses. For descriptive purposes, results are also reported in terms of grade equivalents.

Seventeen students had scores from before and after participation available for analysis. Their scores on the three tests were analyzed using a repeated measures multivariate analysis of variance (MANOVA). A p-value of less than 0.05 was used 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 comprises content completed, days of use, and adherence to the chosen protocol (participation and attendance levels). During the study period, the Bridges Academy elected to use the 30-, 40-, 50-, and 90-Minute protocols for the Fast ForWord products. These protocols called for students to use the product for 30 to 90 minutes a day, five days per week, for four to sixteen weeks. In addition, students generally used the Reading Assistant product for 20 to 30 minutes per day, five days per week, for the duration of the study. Detailed product use for study participants is shown in Tables 2 and 3.

Product	Number of Students	Days Participated	Number of Calendar Days	Percent Complete	Participation Level	Attendance Level
Fast ForWord to Language	4	29	47	74	95	96
Fast ForWord Language to Reading	1	85	164	52	82	83
Fast ForWord to Literacy	7	59	112	90	92	88
Fast ForWord to Literacy Advanced	7	50	95	82	97	86
Fast ForWord Reading Level 1	4	28	66	93	90	91
Fast ForWord Reading Level 2	1	18	43	100	98	86
Fast ForWord Reading Level 3	5	44	84	71	91	87
Fast ForWord Reading Level 5	2	71	152	45	98	81
Total	17	86	166			

Table 2. 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: Many students used multiple products. Not all of the participation days shown here occurred during the study period, as most students began using these Fast ForWord products prior to the pre-test and/or continued using them after the post-test.

Product	Number of Students	Days Participated	Minutes per Day	Time on Task	Words Read	Reading Rate (WPM)	Questions Answered	Percent Correct
Reading Assistant	17	30	23	77%	22,089	99	640	84%

Table 3. Usage data showing the number of students who used the Reading Assistant product, along with group averages for the number of days participated, minutes of product use per day, time on task (the percentage of total product use time spent in one of the product's learning modes, either reading aloud to the computer, listening to recordings, reviewing vocabulary, or answering comprehension questions), total words read (or re-read), reading rate in words per minute (WPM), number of comprehension questions answered, and the percentage of those answers that were correct.

Assessment Results

Seventeen study participants took the Word Identification, Word Attack, and Passage Comprehension tests of the WRMT-R before and after a period of using Fast ForWord and Reading Assistant products. Table 4 and figure 1 show the students' average scores for each subtest.

WRMT-R Subtest	Before		After	
	Mean	SE	Mean	SE
Word Identification	90.5	2.81	93.1	3.19
Word Attack	97.7	2.40	101.8	2.66
Passage Comprehension	88.8	2.82	92.5	2.51

Table 4. Standard scores before and after using Fast ForWord and Reading Assistant products. Mean scores and standard errors are shown for 17 students who took three subtests of the Woodcock Reading Mastery Tests-Revised.

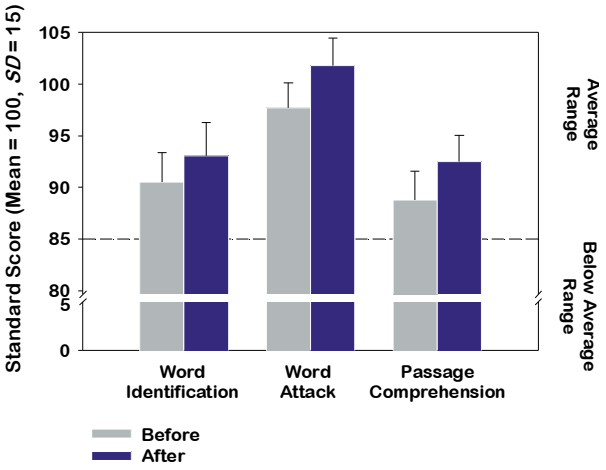

Figure 1. A group of 17 students who used Fast ForWord and Reading Assistant products showed significant improvements in their reading skills.

A MANOVA including all three tests showed significant effects for time and for test, but no interaction between time and test (Table 5). This result indicates that the students were stronger in some skill areas and weaker in others, yet they made similar improvements across all three reading measures. On average, study participants showed significant improvements in reading skills after Fast ForWord and Reading Assistant participation.

WRMT-R	df	MANOVA-F
Test	16	13.22*
Time	16	12.25*
Test x Time	16	0.269

*Table 5. Students made significant improvement in reading skills between the two test administrations. The students' overall performance differed by test, but the lack of a test by time interaction indicates that there were not significant differences between the improvements made on the tests. *p<0.05.*

For descriptive purposes, the students' improvements are also shown in terms of grade equivalent scores. Students participated in the study for an average of three months. In this time, their average grade equivalent scores improved by more than a year on each of the three tests. The most dramatic improvement – one year and three months – was seen on the Basic Skills Composite, which combines the Word Identification and Word Attack tests (Figure 2).

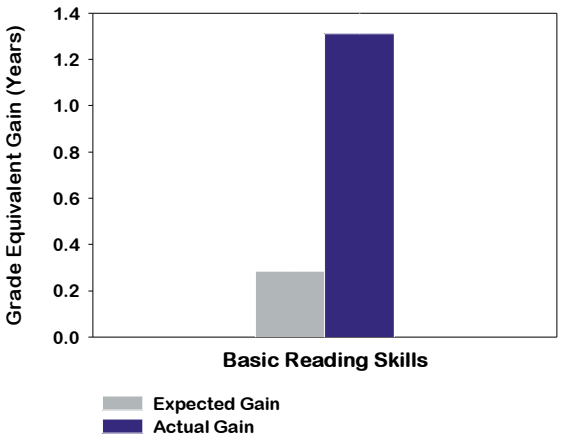

Figure 2. On average, students who used the Fast ForWord and Reading Assistant products significantly improved their Basic Reading Skills, exceeding expected gains given the duration of the study. Results from 17 students are shown.

DISCUSSION

During the 2007-2008 school year, and a 2008 summer school session, 17 elementary, middle, and high school level students at Bridges Academy used the Fast ForWord and Reading Assistant products together and participated in the study reported here. At the beginning and end of the study, students were assessed with the Word Identification, Word Attack, and Passage Comprehension tests of the Woodcock Reading Mastery Tests-Revised (WRMT-R). Study participants made significant improvements across all three measures. These findings show that, at Bridges Academy, an optimal learning environment coupled with a focus on cognitive skills, early reading skills, and guided oral reading can help students rapidly improve their reading skills.

CONCLUSION

Language and reading skills are critical for all students, impacting their ability to benefit from instruction, follow directions and participate in class discussions. After combined use of Fast ForWord and Reading Assistant products, students at Bridges Academy made significant gains in their reading skills. This suggests that using the Fast ForWord and Reading Assistant products strengthened the students' foundational skills and better positioned them to benefit from the classroom curriculum.

Notes:

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