Improved Reading Achievement by Students in the Palmyra Area School District who used Fast ForWord® Products: 2009 - 2011

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ABSTRACT

Purpose: This study investigated the effects of the Fast ForWord products on the reading achievement and skills of elementary and middle school students who used the products within the curriculum in a school setting.

Results: 2010 and 2011 PSSA results were available for 433 students who used the Fast ForWord products during the 2010-11 school year. There was a net increase in achievement level by 34% of the Fast ForWord participants. Longitudinal results were available for 111 students who used the products during the 2009-10 school year. Between the 2009 and 2011 administrations of the PSSA, there was a net increase in achievement level by 46% of the participants. Reading Progress Indicator (RPI) results were available for 705 students who took the assessment two or more times. At the time of the first administration, the students' reading skills were nearly one year below their grade level (3.6 vs a grade level of 4.4). In the five months between the first and last administration of RPI, the students improved their skills by an average of 1 year.

Study Design & Participants: The design of this study was a multi-school observational study using nationally-normed assessments. Study participants were third graders and targeted students in other grades at the elementary and middle school in the Palmyra Area School District of Palmyra, Pennsylvania.

Materials & Implementation: Following staff training on the Fast ForWord products, the students at Palmyra Middle School started using the Fast ForWord products during the 2004-2005 school year. The other four schools in the district started using the products during the 2009-2010 school year. Each spring, the students' reading achievement was evaluated with the Pennsylvania System of School Assessment. In addition, the students' reading skills are measured with Reading Progress Indicator (RPI) before the students use the Fast ForWord products, and again upon completion of each product.

Keywords: Pennsylvania, elementary school, middle school, suburban district, observational study, Fast ForWord Language Series, Fast ForWord Literacy Series, Fast ForWord Reading Levels 1 - 5, Pennsylvania System of School Assessment (PSSA) and/or Reading Progress Indicator.

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.

The Palmyra Area 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 skills and achievement of its students. In this study, commercially available computer-based products (Fast ForWord Language Series, Fast ForWord Literacy Series, Fast ForWord Reading Levels 1 - 5) were used to evaluate the effectiveness of this approach for improving the reading skills and achievement of elementary and middle school students.

METHODS

Participants

The region around Palmyra, an area in Eastern Pennsylvania with abundant fish and game and fertile land, was settled in the early 18th century by two groups of Europeans: the Scotch-Irish and the German Palatinates. Johannes Palm, who served as a soldier and doctor during the Revolutionary War, is given credit with founding Palmyra which was called both Palmstown and Palmyra through the early 19th century at which point it settled on Palmyra. Located between Harrisburg (the state capital) and Lebanon, Palmyra has approximately 7,000 residents and is the headquarters for several companies.

The Palmyra Area School District is a changing district currently serving 3,200 students at six schools. At the time of this study, during the 2010-11 school year, the district contained five schools; 92% of the students were Caucasian, 3% were Hispanic, and 2% were African American. Fifteen percent of the students were eligible for free or reduced-price lunches and 15% were receiving services for special education.

The district first used the Fast ForWord products at the middle school during the 2004-2005 school year, and then expanded its use of the products to all schools during the 2009-2010 school year. During the 2009 – 2011 school years, the district was targeting all 3rd graders for Fast ForWord participation as well as other students who had Individual Education Plans (IEP's) or were English language learners. In addition, at the high school, students who were struggling in their reading classes were also targeted for participation.

This study focuses on 843 students attending the Palmyra Area School District who had PSSA scores and/or RPI scores available for analysis. Of the 843 students, 457 are included in the PSSA analyses, and 705 are included in the RPI analyses (319 students are included in both analyses). The students included in the PSSA analyses were in 4th through 8th grade at the time of use while the students included in the RPI analyses were in kindergarten through 12th grade with the vast majority (62%) in 3rd grade due to the use of the products by all 3rd graders. 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 the online reporting tool, Scientific Learning® Progress Tracker, to monitor student performance; and techniques for measuring the gains students have achieved after Fast ForWord participation.

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.

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/exercises.

Primary Skills / Product Name	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 v2	●	●	●	●		●			●	
Fast ForWord Language to Reading v2	●		●	●	●	●	●		●	
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 4						●	●	●	●	●
Fast ForWord Reading Level 5						●	●	●	●	●

Table 1: The Fast ForWord 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, students' reading achievement and skills were evaluated with the Pennsylvania System of School Assessment (PSSA) and/or Reading Progress Indicator (RPI).

Pennsylvania System of School Assessment (PSSA): The Pennsylvania System of School Assessment (PSSA) is a standards-based criterion-referenced assessment designed to evaluate a student's academic achievement relative to the Pennsylvania state standards. Since the 2005-2006 school year, the assessment has been administered each spring to all students in 3rd – 8th grades as well as students in 11th grade. Results are given in terms of a grade-level dependent scaled score and a proficiency level.

Reading Progress Indicator (RPI): Reading Progress Indicator is a computerized assessment designed to rapidly measure the impact of the Fast ForWord products. It assesses a student's early reading skills including phonemic awareness, decoding, vocabulary, and comprehension.

Analysis

Scores were reported in terms of scaled scores and achievement levels for the PSSA and normal curve equivalents, scaled scores, grade equivalent scores, and percentile scores for Reading Progress Indicator. Scaled scores were used to analyze Reading Progress Indicator scores. Data 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 2010 - 2011 school year, the Palmyra Area School District primarily used the 30-Minute protocols. These protocols call for students to use the products for 30 minutes a day, five days per week for twelve to sixteen weeks. Detailed product use is shown in Table 2.

2010 – 2011 Product Use						
	Number of Students	Days Participated	Number of Calendar Days	Percent Complete	Attendance Level	Participation Level
Fast ForWord Language v. 2	30	57	114	71	73	93
Fast ForWord Language to Reading v. 2	47	57	133	68	69	94
Fast ForWord Literacy	148	34	100	76	56	90
Fast ForWord Literacy Advanced	231	38	125	60	50	89
Fast ForWord Reading Level 1	110	30	63	95	73	96
Fast ForWord Reading Level 2	266	40	81	93	74	97
Fast ForWord Reading Level 3	319	42	105	67	61	92
Fast ForWord Reading Level 4	43	29	68	52	75	88
Fast ForWord Reading Level 5	8	21	35	37	84	91
Total	662	71	179.0	-	61	92

Table 2. Usage data showing the number of students who used the Fast ForWord products during the 2010 – 2011 school year, 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.

Assessment Results

Pennsylvania System of School Assessment (PSSA): Four hundred thirty-three students used the Fast ForWord products during the 2010-2011 school year and had PSSA scores available from both 2010 and 2011. These students were in 4th – 8th grades, and therefore selected to use Fast ForWord products because they had IEP's or were not proficient in English. In 2010, 247 participants (57%) were at the Below Basic or Basic level in their Reading Achievement reflecting the reading challenges of many of the targeted students. In 2011, there was a net increase in achievement level by 34% of the students with the number at Proficient or Advanced increasing from 43% in 2010 to 64% in 2011 (Figure 1).

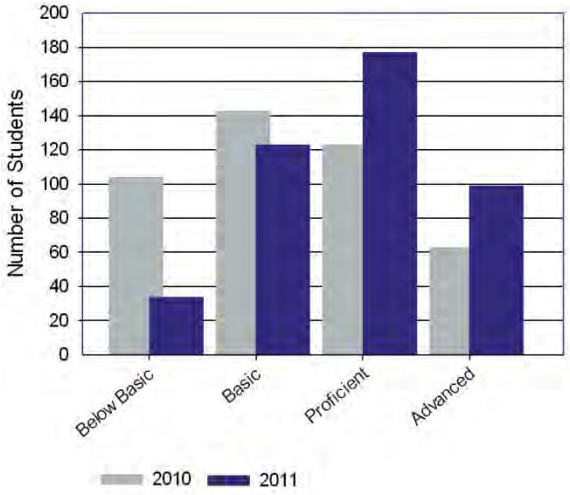

Figure 1. A histogram showing the 2010 and 2011 performance of 433 students who used the Fast ForWord products during the 2010-2011 school year. There was a net increase in achievement level by 34% of the students.

Ninety-nine students first used the Fast ForWord products during the 2009-2010 school year and had PSSA data available from both 2009 and 2011. Eighty percent of those students used the Fast ForWord products during both the 2009-2010 and 2010-2011 school years. Of the 99 students who first used the products during the 2009-2010 school year and had PSSA scores available from both 2009 and 2011, 78 (79%) were initially at the Below Basic or Basic level in reading achievement. Two years later, there was a net increase by 46% of the students with the number at Proficient or Advanced increasing from 22% in 2009 to 46% in 2011.

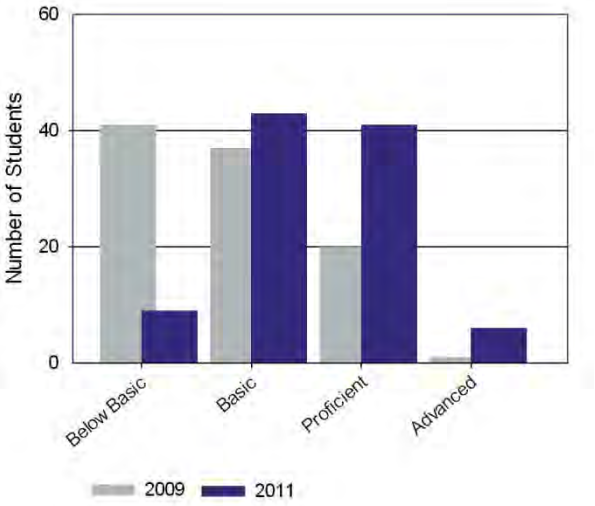

Figure 2. A histogram showing the 2009 and 2011 performance of 99 students who first used the Fast ForWord products during the 2009-2010 school year.

Reading Progress Indicator (RPI): In addition to the PSSA, RPI was used to evaluate the impact of the Fast ForWord products on students in the Palmyra Area School District. RPI was administered before students used the Fast ForWord products, and then again after each product. Three hundred forty-seven students who had two or more administrations of RPI were first administered RPI during the 2010-11 school year. The students ranged from kindergarten through 12th grade with the vast majority (73%) in third grade and 24% in 6th – 10th grades. All other grades had only one or two students.

Since the student selection was very different for the students in third grade (class-wide implementation) and the students in other grades (pull-out for students at risk), the two groups were analyzed separately. The 254 third graders had an initial RPI score of 2.9, very close to grade level. Five months later, the students had made statistically significant improvements ($t(253) = 13.1$; $p < 0.01$), increasing their early reading skills by an average of 1 year and 2 months, to the 4.1 level.

The analysis of the struggling students who were pulled out to use the products included results from 83 students. The students were in 6th – 10th grade with an average grade level of 7.4. Prior to using the Fast ForWord products, their performance on RPI was at the low sixth grade level (6.0), more than one year below grade level. Five months later, the students had made statistically significant gains in their reading skills ($t(82) = 6.3$; $p < 0.01$). The nine months of improvement meant the students' reading skills were at the late sixth grade level (6.9).

Over the years, 705 students have been administered RPI two or more times. Most of the students (62%) were in third grade with another 13% in sixth grade. The students were typically performing 8 months below grade level when they started the products, with a grade level of 4.4 and a performance level of 3.6. During the five months between assessments, the group made statistically significant improvements, increasing their performance from a level to 3.6 at the initial test to 4.6 at their most recent test ($t(704) = 16.1$; $p < 0.01$).

DISCUSSION

The Palmyra Area School District is a high performing district, making AYP every year since 2006, and routinely graduating more than 90% of their students. Despite these impressive statistics, the district does have students who struggle to learn. The district targeted certain students for Fast ForWord participation: students with IEP's, students learning English, and students in high school who were struggling in their reading classes. Prior to Fast ForWord participation, many of these participants were struggling at the Below Basic and Basic levels on the PSSA. After participation, 34% of the students improved one or more achievement levels with the number of students Proficient or above increasing from 43% in 2010 to 64% in 2011.

The other group targeted for Fast ForWord participation during the 2010 – 2011 school year was the 3rd grade class. Due to the class-wide implementation, the third graders made up a majority of the students with Reading Progress Indicator scores, and improved their reading skills by 1 year and 2 months in the 5 months between assessments.

On average, during the 2010 – 2011 school year, Fast ForWord participants in the Palmyra Area School District significantly improved their reading achievement and skills. These findings demonstrate that, within the Palmyra Area School District, an optimal learning environment coupled with a focus on cognitive and early reading skills can help students attain a higher level of reading achievement and 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. Strong linguistic skills also provide a critical foundation for building reading and writing skills. After Fast ForWord use, students in the Palmyra Area School District made significant gains in their reading skills. These results replicate other studies and suggest 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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