Improved Reading Skills and Achievement by Students in the Flushing Community Schools who used Fast ForWord® Products: 2011 - 2012

ABSTRACT

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

Results: Struggling students in early elementary school were selected to use the Fast ForWord products. By the time the students took the Michigan Educational Assessment Program (MEAP) in 3rd grade, 61% of the students were able to demonstrate proficiency on the reading assessment. For students in upper elementary school who were evaluated with the MEAP before and after using the Fast ForWord products, 38% of the students moved up one or more achievement levels. Finally, 97% of the students who used the Fast ForWord products during the 2011-2012 school year improved their reading skills. The statistically significant improvement in RPI scores averaged an increase of one year and 6 months in one year.

Study Design & Participants: The design of these studies were multi-school case studies using nationally-normed and high stakes assessments. Study participants were elementary school students in the Flushing Community Schools of Flushing, Michigan.

Materials & Implementation: Following staff training on the Fast ForWord products, the Flushing Community Schools started using the products with their students during the 2007-2008 school year. This report evaluates Michigan Educational Assessment Program (MEAP) scores from 2011 and 2012. For younger students who used the Fast ForWord products while in early elementary school (K – 2nd grade), MEAP scores were evaluated once the students reached 3rd grade; for older students (3rd grade and above) it was possible to compare students' reading achievement before and after participation. For all students who used the products during the 2011-2012 school year, Reading Progress Indicator (RPI) was used to evaluate reading skills before and after participation and determine change.

Keywords: Michigan, elementary school, urban district, observational study, Fast ForWord Language Basics, Fast ForWord Language v2, Fast ForWord Language to Reading v2, Fast ForWord Reading Readiness, Fast ForWord Reading Level 1, Fast ForWord Reading Level 2, Fast ForWord Reading Level 3, Michigan Educational Assessment Program (MEAP), Reading Progress Indicator (RPI).

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 Flushing Community Schools were 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 and language achievement of their students. In this report, commercially available computer-based products (Fast ForWord Language Basics, Fast ForWord Language v2, and Fast ForWord Language to Reading v2, Fast ForWord Reading Readiness, and Fast ForWord Reading Levels 1-3) were used to evaluate the effectiveness of this approach for improving the reading skills and achievement of elementary school students.

METHODS
Participants
The Flushing Community Schools serve nearly 4,500 students. Approximately 90% of the students in the district are Caucasian, 5% are African American, 2% are Unspecified and 1% or fewer are Asian, Hispanic, or Native American. 25% of the students are eligible for free or reduced-price lunches, fewer than 1% are English language learners, and 12% receive services for Special Education.

The four elementary schools (1st – 6th grades) and the Early Childhood Center (Kindergartners) have been using the Fast ForWord products for several years. Most of the students who have used the products were in early elementary school and struggling; they were not on target to pass the Michigan Educational Assessment Program (MEAP) as 3rd graders. Some of the students were in upper elementary school and had demonstrated difficulties passing the MEAP.

This report contains three studies. The first study tracks the students who used the Fast ForWord products in early elementary school to determine whether they passed the MEAP when first tested, at the start of third grade. The next study evaluates changes in MEAP performance for students in upper elementary school who used the products during the 2011-2012 school year and were assessed with the MEAP before and after Fast ForWord participation. The final study evaluates the reading skills of all students who used the products during the 2011-2012 school year and were assessed with Reading Progress Indicator (RPI) before and after Fast ForWord participation.

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 tools, Scientific Learning® Progress Tracker and MySciLEARN™, to monitor student performance; and techniques for measuring the gains students have achieved after Fast ForWord use.

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.

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 Basics	●									
Fast ForWord Language v2	●	●	●	●		●			●	
Fast ForWord Language to Reading v2	●		●	●	●	●	●		●	
Fast ForWord Reading Readiness				●		●	●			
Fast ForWord Reading Level 1					●	●	●	●	●	●
Fast ForWord Reading Level 2					●	●	●	●	●	●
Fast ForWord Reading Level 3						●	●	●	●	●

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

Each fall, the reading achievement of students in 3rd – 8th grade was assessed with the Michigan Educational Assessment Program (MEAP). Students who were in early elementary school did not have their reading achievement assessed with the MEAP until they reached third grade. Students in upper elementary school had their reading achievement assessed each fall, before and after Fast ForWord product use. In addition, student reading skills were assessed before and after product use with Reading Progress Indicator (RPI).

Michigan Educational Assessment Program (MEAP): The MEAP is a standardized set of high stakes assessments administered each fall to students in 3rd through 8th grades. It was developed to measure skills that Michigan educators believe all students should master, and measures Michigan students and schools against standards established by the Michigan State Board of Education. Each year, student achievement in Reading and Math are assessed with scores reported back in terms of an achievement level ranging from Level 4 (Not Proficient) to Level 1 (Advanced) and a grade- and subject-dependent scaled score.

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 MEAP, and normal curve equivalents, scaled scores, grade equivalent scores, and percentile scores for Reading Progress Indicator. Changes in MEAP achievement levels were analyzed using a Monte Carlo implementation of a Non-Parametric Randomization Test (McNPR test). This statistical analysis looks for an intervention effect by comparing the number of students whose performance level went up to the number whose performance level went down. Changes in RPI scores were analyzed using paired t-tests. Both 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). The Flushing Community Schools chose to use the 30-Minute protocols. These protocols call for students to use the product for 30 minute a day, five days per week for twelve to sixteen weeks. It is recommended that students complete two products each year. On average, the 129 students in the first study used the products for 87 days across 8½ months. The students had an average Attendance Level of 70%, and Participation Level of 96%. Most students used multiple products, completing one or two. For the second and third study, the 138 students with scores from before and after Fast ForWord participation used the products for an average of 133 days across 14 months. The students had an average Attendance Level of 71% and an average Participation Level of 97%. Most students used multiple products, completing two or more. Detailed product use is shown in Tables 2-5.

Study 1: Students with Use PRIOR to 3rd Grade Assessment						
	Number of Students	Days Participated	Number of Calendar Days	Percent Complete	Attendance Level	Participation Level
Fast ForWord Language Basics	75	6	10	98%	82%	97%
Fast ForWord Language v2	124	53	145	78%	70%	94%
Fast ForWord Language to Reading v2	74	42	149	61%	71%	96%
Fast ForWord Reading Readiness	23	32	84	85%	62%	100%
Fast ForWord Reading Level 1	16	22	48	69%	78%	99%
Fast ForWord Reading Level 2	4*	--	--	--	--	--
Total	129	87	253	--	70%	96%

*Table 2. Product use data for students who started using the products prior to 3rd grade and were included in the first study. Data includes all product use for the students in the study, 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. *Details are not shown for products used by fewer than 5 students. Note: Students often use multiple products.*

Study 1: Assessed After Fast ForWord Participation, ONLY		
Products Completed (excluding Fast ForWord Language Basics)	N	Percent
0	48	37%
1	62	48%
2 or more	9	15%

Table 3. Most students included in this study completed multiple products

Studies 2 & 3: Assessed Before and After Fast ForWord Participation		
Products Completed (excluding Fast ForWord Language Basics)	N	Percent
0	10	7%
1	54	39%
2	28	21%
3	23	17%
4 or more	22	16%

Table 4. Most students included in this study completed multiple products

Studies 2 & 3: Assessed Before and After Fast ForWord Participation						
	Number of Students	Days Participated	Number of Calendar Days	Percent Complete	Attendance Level	Participation Level
Fast ForWord Language Basics	52	6	10	97%	78%	96%
Fast ForWord Language v2	132	53	149	87%	70%	95%
Fast ForWord Language to Reading v2	109	49	184	68%	74%	97%
Fast ForWord Reading Readiness	23	32	103	84%	54%	94%
Fast ForWord Reading Level 1	77	27	77	88%	71%	97%
Fast ForWord Reading Level 2	60	33	115	71%	69%	96%
Fast ForWord Reading Level 3	26	35	84	62%	72%	97%
Total	138	133	418	--	71%	97%

Table 5. Product use data for the students who used the products during the 2011-2012 school year and had MEAP Reading scores from 2011 and 2012 (n = 61),and/or RPI scores from before and after product use (n = 131). Data includes products used before and after the 2011-2012 school year, as well as products used during that year. Total values reflect the average total number of days that students used products. Note: Students often use multiple products.

Assessment Results

Michigan Educational Assessment Program (MEAP): 129 students below the 3rd grade level used the Fast ForWord products during the 2009-2012 school years, and had MEAP scores available from their first assessment as 3rd graders in the Fall of 2011 or 2012.

The students were selected for product use because they were not expected to pass the MEAP.

Of the 129 students, 79 (61%) were at Achievement Level 1 (Advanced) or 2 (Proficient) on the MEAP Reading test (Figure 1).
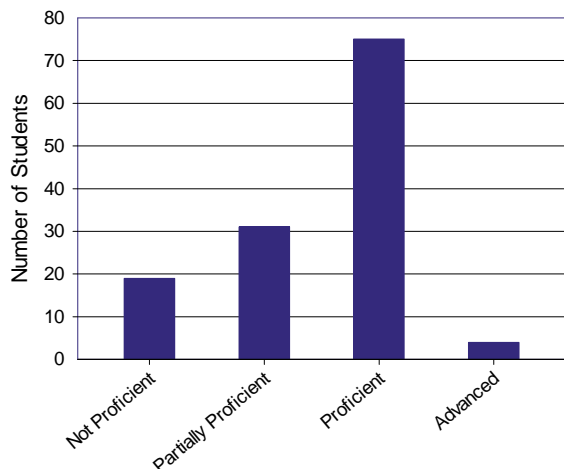
Figure 1. Struggling students in early elementary school were selected to use the Fast ForWord products. At the time of their first MEAP administration, most of the students (61%) demonstrated proficiency on the reading assessment.
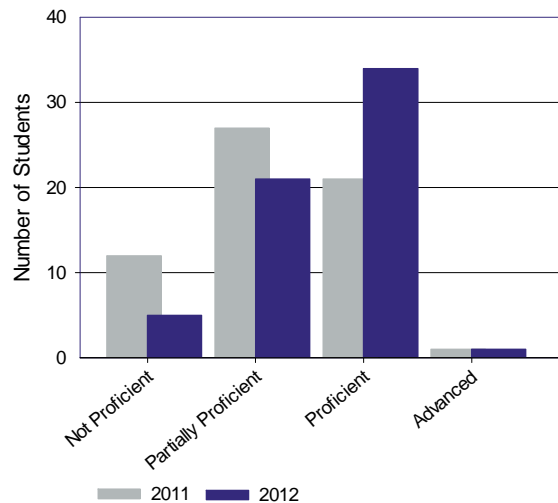

Figure 2. Students in upper elementary school who were evaluated with the MEAP before and after Fast ForWord participation tended to show improvements on their MEAP Reading Achievement Level.

Sixty-one students used the Fast ForWord products during the 2011-2012 school year and had MEAP Reading scores available from both 2011 and 2012. Of the 61 students, 23 (38%) moved up one or more Achievement Levels between 2011 and 2012 (Figure

2; Table 6). A McNPR test confirmed that across the students, more Fast ForWord participants improved their MEAP Reading achievement level than would be expected by chance (p < 0.05).

		2012				2011 Totals	2012 Totals
		Not Proficient	Partially Proficient	Proficient	Advanced		
2011	Not Proficient	3	7	2	0	12	5
	Partially Proficient	2	12	13	0	27	21
	Proficient	0	2	18	1	21	34
	Advanced	0	0	1	0	1	1
	2011 Totals	12	27	21	1	61	61

Table 6. The group of 61 students who used Fast ForWord products made improvements between the 2011 and 2012 administrations of the MEAP assessments. Students in the green section (upper right) increased one or more proficiency levels while students in the red section (lower left) decreased. The white boxes on the diagonal indicate students who maintained a constant proficiency level. Rows and columns are summed to give 2011 and 2012 totals. For ease of comparison between the two years, 2011 totals are also in the right-most column.

Reading Progress Indicator (RPI): In addition to the MEAP, RPI was used to evaluate the impact of the Fast ForWord products on students in the Flushing Community Schools who used the Fast ForWord products during the 2011-2012 school year. RPI was administered before and after each Fast ForWord product. One hundred thirty-one students in Kindergarten through fourth grade had pre- and post-participation scores and are included in the RPI evaluation. Of these students, 127 (97%) showed improvement. Before Fast ForWord participation, the students' average reading skill-level was 0.8, substantially lower than their average grade level of 1.5. On average, there was 1 year between the first and last RPI administration. In that time, the students' skills improved to the 2.4 level, an improvement of

one year and six months. This corresponds to improving from the 16th percentile to the 46th percentile and is a statistically significant improvement in scaled score (t(130) = 20.5; p < 0.001).

DISCUSSION

In the Fall of 2011, the Michigan Department of Education raised the cut-scores required to achieve each performance level. This was expected to decrease the number of students meeting proficiency targets by as much as 25%. The Flushing Community Schools were ready for the increased challenge. By using the Fast ForWord products with their struggling readers in the early elementary grades, educators were able to help 61% of these students achieve reading proficiency by the fall of 3rd grade – the time of their

first MEAP test. Older students who had MEAP Reading scores available from before and after Fast ForWord participation also demonstrated success, with 38% of them improving one or more achievement levels on the MEAP Reading test.

Overall, the students selected to use the Fast ForWord products were struggling readers, as confirmed by their initial RPI performance. Although most of the participants were still in early elementary school, these students had experienced a challenging academic start and had already fallen an average of 7 months below grade level in their reading skills. After using the Fast ForWord products to improve critical language and literacy skills along with fundamental learning skills (memory, attention, processing, and sequencing), these students were rapidly catching up; they improved their reading skills by 1 year and 6 months in the year between their first and last assessments. These findings demonstrate that, within the Flushing Community Schools, an optimal learning environment coupled with a focus on cognitive and early reading skills can help students attain a higher level of reading skills and achievement.

CONCLUSION

Language and literacy 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 Flushing Community Schools made significant gains in their reading skills and achievement. 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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