

Improved Reading Skills by Students in Williamsport Area School District who used Fast ForWord® Language

MAPS for Learning: Educator Reports, 9(15)1-4

ABSTRACT

Purpose: This study investigated the effects of the Fast ForWord Language product on the reading skills of elementary school students who used the product within the curriculum in a school setting. **Study Design:** The design of this study was a single school case study using standardized tests. **Participants:** Study participants were 38 second grade students who were attending Jackson Elementary School in the Williamsport Area School District of Williamsport, PA. **Materials & Implementation:** Following staff training on the Fast ForWord Language product, a group of students used the product during the Fall of the 2004 – 2005 school year. Student reading ability was evaluated with the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) before and after Fast ForWord participation. **Results:** On average, students made significant improvements in reading ability, either moving closer to or meeting the benchmark goal for Oral Reading Fluency and Phoneme Segmentation Fluency after using the Fast ForWord product.

Keywords: Pennsylvania, elementary school, urban district, observational study, Fast ForWord Language, Dynamic Indicators of Basic Early Literacy Skills (DIBELS).

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 Williamsport 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 for improving the reading skills of students in a school setting. In this study, a commercially available computer-based product (Fast ForWord Language) was used to evaluate the effectiveness of this approach at improving the reading skills of elementary school students.

METHODS

Participants

Located in north central Pennsylvania in Lycoming County, the largest geographical county in the state and part of the Allegheny Mountain range of the Appalachian Mountains, Williamsport is approximately 200 miles northwest of Philadelphia. The Williamsport Area School District is the largest in its area with 12 schools and a student population of over 6,000 in Kindergarten through twelfth grade. Jackson Elementary, one of the schools in this district, chose to use the Fast ForWord Language product during the Fall of the 2004 – 2005 school year and took part in this study.

Jackson Elementary is a Kindergarten through fifth grade school with approximately 600 students. Approximately 73% of the student population is Caucasian and 25% is African-American. Nearly 65% of students receive free or reduced price lunches.

Thirty-eight students in the second grade used the Fast ForWord Language product in the Fall of the 2004 – 2005 school year and were evaluated with the DIBELS before and after product use. 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 Language product is a computer-based product that combines an optimal learning environment with a focus on early reading and cognitive skills. The product includes seven exercises designed to build skills critical for reading and learning, such as auditory processing, memory, attention, and language comprehension.

Circus Sequence: 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. This exercise improves working memory, sound processing speed, and sequencing skills.

Old MacDonald's Flying Farm: Students use the computer mouse to catch and hold a flying animal. The animal repeats a single syllable several times, and students must release the animal when they hear a change in the syllable. This exercise improves auditory processing, develops phoneme discrimination, and increases sustained and focused attention.

Phoneme Identification: First, students listen as one animal character utters a phoneme, and then two new animals utter similar phonemes. The students identify which of the latter two sounds was identical to the first phoneme. This exercise improves auditory discrimination skills, increases sound processing speed, improves working memory, and helps students identify specific phonemes.

Phonic Match: 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. This exercise develops auditory word recognition and phoneme

discrimination, improves working memory, and improves rate of auditory processing.

Phonic Words: Students see two pictures representing two similar words that differ only by initial or final consonant ("tack" versus "tag"). When students hear the word representing one of the pictures, 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.

Language Comprehension Builder: Students listen to a sentence that depicts action and complex relational themes. Students must match a picture representation with the sentence they just heard. This exercise develops oral language and listening comprehension, improves understanding of syntax and morphology, and improves rate of auditory processing.

Block Commander: In Block Commander, a three-dimensional board game is filled with familiar shapes that students select and manipulate. The students are asked to follow increasingly complex commands. This exercise increases listening comprehension and the ability to follow directions, improves syntax, develops working memory, and improves sound processing speed.

Assessments

Students were assessed with the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) before and after participation on the Fast ForWord Language product.

Dynamic Indicators of Basic Early Literacy Skills (DIBELS): The DIBELS are standardized, individually administered measures of early literacy development designed to monitor the development of pre-reading and early reading skills. Skills assessed range from phonemic awareness to phonics to fluency. The appropriate skills for measuring with the DIBELS vary with the grade of the students. For students in the second grade and beyond, the appropriate measure is Oral Reading Fluency.

The Institute for the Development of Educational Achievement, in accordance with the Reading First legislation, recognizes the DIBELS as an appropriate assessment for measuring improvement in the reading skills of children in early elementary school.

The DIBELS measures used in this study, Oral Reading Fluency and Phoneme Segmentation Fluency, are standardized tests of accuracy and fluency and phonological awareness.

Analysis

Scores were reported in terms of DIBELS assessment scores. Data were analyzed using a repeated measures multivariate analysis of variance (MANOVA). Dependent t-tests were used for post hoc analyses. 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, Jackson Elementary chose to use the 50-Minute Fast ForWord Language Protocol.

These protocol calls for students to use the product for 50 minutes a day, 5 days per week for eight to twelve weeks.

All 38 students used the Fast ForWord Language product and completed an average of 57% of the product content. Detailed usage information is shown in Table 1.

	Number of Students	Days Participated	Number of Calendar Days	Percent Complete	Participation Level
Fast ForWord Language	38	53	100	58%	76%

Table 1. Usage data showing the number of students who used the Fast ForWord Language 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 participation level.

Figure 1 shows the average daily progress through the Fast ForWord Language product exercises. 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.

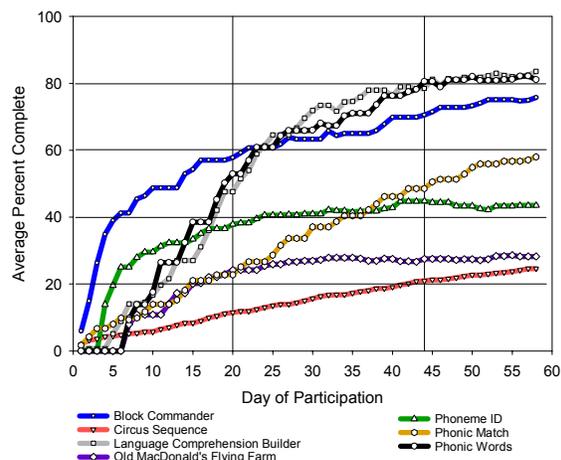


Figure 1. Average daily progress history through the Fast ForWord Language product. Results from 38 students are shown.

Assessment Results

Dynamic Indicators of Basic Early Literacy

(DIBELS): Students were evaluated with the DIBELS before and after Fast ForWord use. On average, students were performing below their benchmark level on Oral Reading Fluency and Phoneme Segmentation Fluency before using the Fast ForWord product. After Fast ForWord participation, students, on average, made significant improvements in reading ability, reaching the beginning of the year benchmark goal for Oral Reading Fluency (Figure 2).

The appropriate DIBELS assessment for second graders is Oral Reading Fluency. Along with this test, students in this study were also assessed with the Phoneme Segmentation Fluency measure of the DIBELS which is appropriate for first grade students and has no benchmark goals available for second graders. Using the benchmark goals for first graders, the 38 second grade students were performing below the benchmark at a DIBELS score of 25 before using the Fast ForWord Language product. After Fast ForWord participation, students on average made significant gains, moving closer to the first grade benchmark goal for Phoneme Segmentation Fluency (Figure 3).

A MANOVA showed that students significantly improved between the two DIBELS assessment tests. There were significant differences between the improvements in Oral Reading Fluency and Phoneme Segmentation Fluency. Post hoc tests showed that, for both tests, the improvements were significant with greater improvement for the Oral Reading Fluency measure (Table 2).

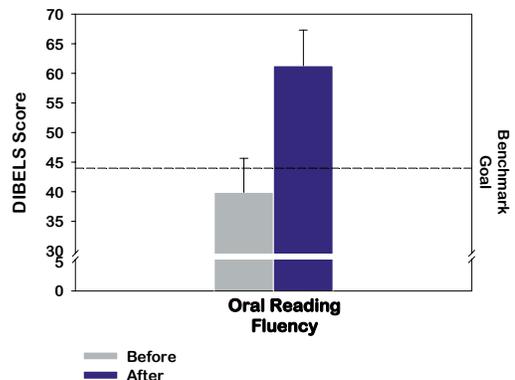


Figure 2. Students, on average, made significant improvements after Fast ForWord use and met the benchmark goal for oral reading fluency. Results from 38 students are shown.

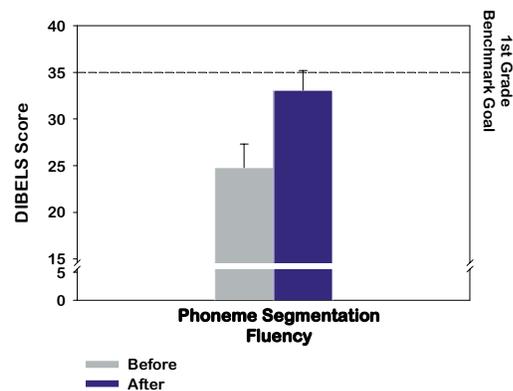


Figure 3. On average, students significantly improved their reading skills after participating on the Fast ForWord product. Results from 38 second grade students are shown; the benchmark goal shown is appropriate for first graders.

	n	Before		After		t-statistic	MANOVA f		
		Mean	SE	Mean	SE		Subtest	Time	Subtest x Time
Oral Reading Fluency	38	39.9	5.7	61.2	6.0	9.1*			
Phoneme Segmentation Fluency	38	24.7	2.5	33.0	2.1	3.7*			
							13.2*	92.7*	15.2*

Table 2. After Fast ForWord participation, students, on average, made significant improvements in both Oral Reading Fluency and Phoneme Segmentation Fluency. * $p < 0.05$.

DISCUSSION

During the Fall of the 2004 – 2005 school year, second graders in Jackson Elementary in Williamsport Area School District used the Fast ForWord Language product. On average, students made significant improvements in reading skills, moving closer to or achieving their benchmark goals after Fast ForWord use. Their reading rate increased by 50% from 40 words per minute to 61 words per minute. These findings demonstrate that, within Jackson Elementary, an optimal learning environment coupled with a focus on cognitive and early reading skills can help students attain a higher level of reading 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 participation, students in the Williamsport Area School District made significant gains in their reading ability. This suggests that using the Fast ForWord products strengthened the students' foundational skills and helped them benefit more from the classroom curriculum.

Notes:

To cite this report: Scientific Learning Corporation. (2005). Improved Reading Skills by Students in Williamsport Area School District who used Fast ForWord® Language, MAPS for Learning: Educator Reports, Vol. 9, No. 15: pp. 1-4.

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