

Improved Early Reading Skills by Students in the Springfield City School District who used Fast ForWord® Products

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ABSTRACT

Purpose: This study investigated the effects of the Fast ForWord to Reading 1 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 randomized control trial with students in a single school. A nationally-normed test was used to evaluate efficacy. **Participants:** Study participants were 100 first- and second-grade students attending Kenwood Heights Elementary School in the Springfield City School District of Springfield, Ohio. Students were randomly assigned to one of two groups; half of the students used the Fast ForWord products while the other half served as a comparison group and did not use the product. **Materials & Implementation:** Following staff training on the Fast ForWord to Reading 1 product, a group of students started to use the product in April of the 2004 – 2005 school year. Before and after Fast ForWord participation, students' early reading skills were evaluated with the Test of Phonological Awareness (TOPA). **Results:** On average, students made significant improvements after Fast ForWord use, with the Fast ForWord participants significantly outperforming the comparison group and gaining over half a standard deviation in measures of phonological awareness.

Keywords: Ohio, public elementary school, urban district, experimental study, randomized control group, Fast ForWord to Reading 1, Test of Phonological Awareness (TOPA).

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 Springfield City 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 of improving the reading abilities of students in a school setting. In this study, a commercially available computer-based product (Fast ForWord to Reading 1) was used to evaluate the effectiveness of this approach at improving the reading skills of early elementary school students.

METHODS

Participants

The Springfield City School District, located in Clark County in Springfield, Ohio, is a pre-Kindergarten through twelfth grade urban school district with a student population of 9,425. Kenwood Heights Elementary, one of the 10 elementary schools in the district, chose to use the Fast ForWord to Reading 1 product starting in April of the 2004 – 2005 school year and took part in this study.

Kenwood Heights Elementary is a K-5 school serving 375 students. Sixty-nine percent of the students are Caucasian and 22% are African-American. Seventy-five percent of students receive free or reduced price lunches. The elementary school is a Title-I and Reading First school.

Fifty first-grade students and 50 second-grade students participated in this study. Teachers were asked to rate the students academically compared to their peers on a scale of 1-5 (1 being the lowest, 5 being the highest). On average, the study participants were rated as having an academic achievement of 2.5 (falling between “below average” and “average”). All of the 100 participants were eligible to be assigned to either group. Using computer-generated random numbers, half of the study participants were randomly assigned to the Fast ForWord group. All students in the Fast

ForWord group, including the second graders, used the Fast ForWord to Reading 1 product, a product designed using first-grade curriculum standards. The other half of the study participants were assigned to a comparison group.

All study participants received phonological awareness instruction as part of daily Harcourt Brace Trophies lessons presented during the 90-minute Reading First reading block. In addition to this, regular administrations of the Dynamic Indicators of Early Literacy Skills (DIBELS) were used to identify students in need of additional instruction. Identified students received small group instruction from the two tutors assigned to Kenwood Heights. The small group instruction used Voyager and Reading Rods® from ETA/Cuisenaire®.

While students in the experimental group used the Fast ForWord to Reading 1 product, students in the comparison group received additional instruction on Harcourt Brace Trophies, Voyager, and ETA/Cuisenaire® Reading Rods® in small groups with homeroom teachers and tutors.

Six participants (five from the comparison group and one from the Fast ForWord group) had used the Fast ForWord Basics product before participating in the study. The remaining students had not previously used any Fast ForWord products.

All students had their phonemic awareness skills, an early reading skill, evaluated with the Test of Phonological Awareness (TOPA) before and after the Fast ForWord group used the product. 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 to Reading 1 product is a computer-based product that combines an optimal learning

environment with a focus on early reading and cognitive skills. The product includes six exercises designed to build skills critical for reading and learning, such as auditory processing, memory, attention, and language comprehension.

Bear Bags: In these exercises, the participant is asked to help Mama Bear sort words (on pieces of toast) into phoneme-based categories (in lunch bags). They develop phonemic awareness and decoding of single-syllable words. Bear Bags also develops understanding of alphabetic principles (phonics).

Magic Rabbit: These exercises combine spelling and word-building practice with spelling patterns and word families commonly studied in 1st grade. The task is designed to emphasize the relationships between words by showing how one word can be turned into another by simply changing a single letter in any position. Using a click and drag interface, the participant must either select the missing letter to complete a partially spelled word or rearrange scrambled letter tiles to spell a word. This exercise develops spelling and sensitivity to letter-sound correspondences.

Flying Fish: In this exercise, a fishing pelican pronounces a word. Then a series of spoken and/or written words (on fish) fly across the pond and the participant clicks on the word when it matches the pronounced word. This exercise develops decoding skills, identification of sight words, and auditory memory.

Quail Mail: In Quail Mail, a squirrel mail carrier pulls words out of a mailbag and the participant sorts them into different categories by clicking on the appropriate mailbox. This exercise encourages flexibility during reading and automatic access to the various dimensions of vocabulary.

Bedtime Beasties: This exercise uses the “cloze task,” in which a written and aurally presented sentence has a word missing. The participant must select the correct word to complete the sentence from four choices. Vocabulary skills and sentence comprehension are developed in these exercises.

Buzz Fly: In this exercise, the participant listens to a passage and answers comprehension questions relating to each passage. The questions are aurally presented and written, and the response choices are presented as pictures. This exercise develops listening comprehension and working memory skills as measured by performance on multiple-choice questions.

Assessments

School personnel evaluated all students with the Test of Phonological Awareness (TOPA) before Fast ForWord use and again after the Fast ForWord group participated on the product. Tests were returned for scoring and analysis.

Test of Phonological Awareness (TOPA): The TOPA is a nationally-normed, group-administered measure of phonological awareness. Its two subtests are Phonological Awareness and Letter-Sounds. The Early Elementary version of the assessment is appropriate for first and second graders.

The Phonological Awareness subtest measures the child's ability to isolate individual phonemes in spoken words. In the Early Elementary version of the assessment, the child is asked to isolate initial and final phonemes.

The Letter-Sounds subtest measures the student's ability to understand the relationships between letters and phonemes in English. It requires the children to spell simple pseudowords that are given as the names of "funny animals". The words vary from two to five phonemes in length, and they are all single-syllable.

The Institute for the Development of Educational Achievement, in accordance with the Reading First legislation, determined that the TOPA subtests are appropriate outcome assessments for accurately measuring improvement in phonemic awareness, an early reading skill, of children in early elementary school.

Analysis

Normal Curve Equivalents (NCE's) were used for the analyses. NCE's have a mean equal to 50 and a standard deviation approximately equal to 21. Data were analyzed using a repeated measures multivariate analysis of variance (MANOVA). All analyses used a p-value of less than 0.05 as the criterion for identifying statistical significance.

	Number of Students	Days Participated	Number of Calendar Days	Percent Complete	Participation Level
Fast ForWord to Reading 1: 1 st graders	25	24	37	73%	81%
Fast ForWord to Reading 1: 2 nd graders	25	24	34	89%	75%

Table 1. Usage data showing the number of students who used the Fast ForWord to Reading 1 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. Results are shown by grade level.

Assessment Results

Test of Phonological Awareness (TOPA): The TOPA was used to evaluate the phonemic awareness skills of the students in this study, both before and after the Fast ForWord group used the Fast ForWord to Reading 1 product. Four students (two from the comparison group, two from the Fast ForWord group) were older than nine years old at one or both testing times, which is too old for the norms of the TOPA. Therefore, their scores were not included in the analyses. Three additional students from the comparison group moved during the study. These seven students account for the missing tests. Normal

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 months of April and May of the 2004 – 2005 school year, Kenwood Heights Elementary chose to use the 48-Minute Fast ForWord to Reading 1 Protocol. This protocol calls for students to use the product for 48 minutes per day, 5 days a week for eight to 12 weeks.

Fifty students (25 first graders and 25 second graders) were randomly assigned to the Fast ForWord group, and 50 students served as a comparison group. Random assignment to either the Fast ForWord or comparison group was designated using SPSS statistical software. Only the Fast ForWord group used the Fast ForWord to Reading 1 product during the study. Detailed usage information for the Fast ForWord group is shown in Table 1.

Figures 1 and 2 show the average daily progress through the Fast ForWord to Reading 1 product exercises for the 50 first- and second-grade students who used the product. 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.

Curve Equivalents (NCE's) from the TOPA were used in the analyses.

Students as a whole were performing within the average range in phonemic awareness skills before Fast ForWord use. At the time of post-testing, after the Fast ForWord group participated on the product, both groups of students had made significant improvements on the Phonological Awareness subtest of the TOPA, but only the Fast ForWord group made significant improvements on the Letter-Sounds Subtest.

On the Phonological Awareness subtest, the Fast ForWord group of students improved their average score by 14.6, over two-thirds of a standard deviation, compared to an improvement of 9.2 by the comparison

group. The Fast ForWord group had an average gain of 6.5 on the Letter-Sounds subtest, while the comparison group showed very little movement (Table 2).

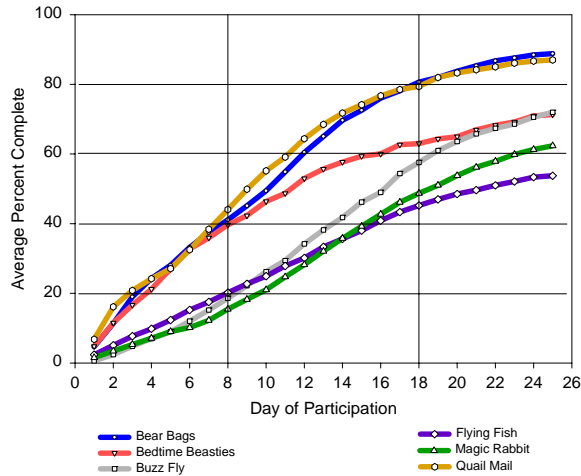


Figure 1. Average daily progress through the Fast ForWord to Reading 1 exercises. Results from 25 first graders are shown.

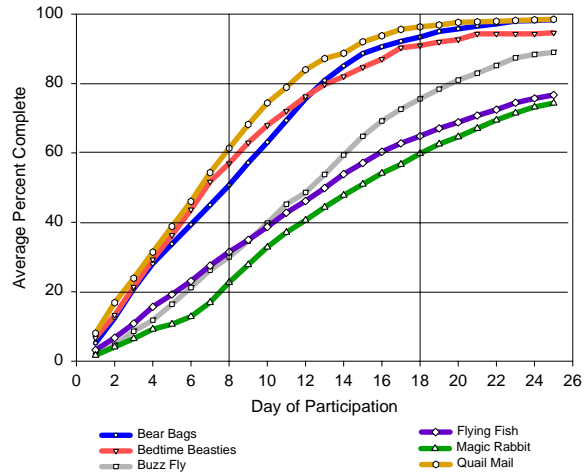


Figure 2. Average daily progress through the Fast ForWord to Reading 1 exercises. Results from 25 second-grade students are shown.

Group	Subtest	n	Before		After	
			Mean	SE	Mean	SE
Fast ForWord	Phonological Awareness	48	43.3	3.1	57.9	3.6
	Letter-Sounds	48	36.5	2.3	43.1	2.4
Comparison	Phonological Awareness	45	35.6	3.0	44.8	3.8
	Letter-Sounds	45	36.1	2.8	36.6	2.7

Table 2. Students made significant gains and outperformed a comparison group of their peers on the TOPA after using the Fast ForWord to Reading 1 product.

A MANOVA (Table 3) showed a significant difference by time and by subtest. There was also a significant difference by time by group, indicating the first and second graders in the Fast ForWord group had significantly greater improvements over time than the first and second graders in the comparison group. Differences between the improvements on the Phonological Awareness subtest and the Letter-Sounds subtest were not significant.

An analysis was performed to examine the effect of grade. Adding grade into the overall model weakened the effects. Inspection of effects by grade showed that first graders who used the Fast ForWord to Reading 1 product had significant improvements in early reading skills, ($F=4.38, df=47, p=0.04$), but second graders did not ($F=0.63, df=42, p=0.43$).

	MANOVA	
	Df	f
subtest	91	17.4*
time	91	28.6*
time x group	91	4.1*

Table 3. A MANOVA showed that students who used the Fast ForWord to Reading 1 product had significantly greater improvements on tests of phonemic awareness than a comparison group. * $p<0.05$.

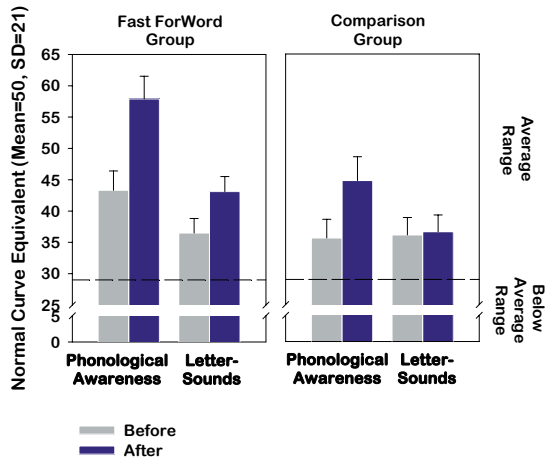


Figure 3. Fast ForWord participants significantly outperformed a comparison group in phonemic awareness skills after using the Fast ForWord to Reading 1 product.

DISCUSSION

During the spring of the 2004 – 2005 school year, a group of 50 students from Kenwood Heights Elementary used the Fast ForWord to Reading 1 product. Overall, students made significant improvements on phonemic awareness, a critical early reading skill, after Fast ForWord participation and significantly outperformed a comparison group of their peers who did not use the product. These findings suggest that, within Kenwood Heights Elementary in the Springfield City 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.

CONCLUSION

Strong cognitive and linguistic skills provide a critical foundation for building reading and writing skills. The Fast ForWord to Reading 1 product builds this

foundation through development of auditory memory, attention, and sequencing, and by exercising early reading skills including phonics, vocabulary, fluency and comprehension. This study demonstrates that students in the Springfield City School District who used the Fast ForWord to Reading 1 product improved their phonemic awareness skills more than a comparison group that used the standard curriculum. These results suggest that using the Fast ForWord product strengthened the students' foundational and early reading skills and will allow them to benefit more from the classroom curriculum.

Notes:

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