

Improved Reading Skills by Students in the Everett Public Schools who used Fast ForWord[®] Products

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ABSTRACT

Purpose: This study investigated the effects of the Fast ForWord products on the reading skills of students who used the products within the curriculum in a school setting. **Study Design:** The design of this study was a multiple school study using high stakes and/or reading tests. **Participants:** Study participants were 1012 students attending elementary and middle schools in the Everett Public Schools, in Everett, Massachusetts. **Materials & Implementation:** Before and after participation on the Fast ForWord products, students were evaluated with the Massachusetts Comprehensive Assessment System (MCAS) and/or the Gates-MacGinitie Reading Tests (GMRT). **Results:** Before Fast ForWord participation, 16% of the study participants were proficient in Reading. Following Fast ForWord participation, the group of students significantly improved their Reading, as measured by the MCAS, with 38% of the students achieving proficiency. One-third of the students who were initially at “Needs Improvement” moved into the “Proficient” level. Of the 853 students in the study who were assessed on the MCAS, 32% moved up one or more categories. Of the 765 students evaluated with the Gates-MacGinitie Reading Tests, average improvement was 22 months in the 10 months between the pre- and post-tests.

Keywords: Massachusetts, elementary school, middle school, urban, observational study, Fast ForWord Language, Fast ForWord Language to Reading, Fast ForWord to Literacy, Fast ForWord to Literacy Advanced, Fast ForWord to Reading 2, Fast ForWord to Reading 3, Fast ForWord to Reading 4, Fast ForWord to Reading 5, Massachusetts Comprehensive Assessment System (MCAS), Gates-MacGinitie Reading Tests (GMRT).

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 Everett Public Schools were interested in evaluating the effectiveness of an optimal learning environment with a focus on early reading and cognitive skills as a way for improving reading skills of students in a school setting. In this study, commercially available computer-based products (Fast ForWord Language, Fast ForWord Language to Reading, Fast ForWord to Reading 2, Fast ForWord to Reading 3, Fast ForWord to Reading 4, and Fast ForWord to Reading 5) were used to evaluate the effectiveness of this approach at improving the reading skills of students

METHODS

Participants

The Everett Public Schools in Massachusetts are located a few miles north of Boston. Serving approximately 5,000 students, they consist of six

schools. Five schools serve students in prekindergarten through eighth grade, and one is a high school. Approximately 50% of the students in the district are classified as economically disadvantaged and 15% are receiving services for special education. Eight percent are English language learners.

The students that were a part of this study and had Massachusetts Comprehensive Assessment System (MCAS) scores were more likely to be economically disadvantaged but otherwise, they were a good representation of the district. Of the students with MCAS scale scores, 65% were economically disadvantaged, 17% were receiving services for special education, and 7% were English language learners.

One thousand twelve students are included in this study and had scores from the MCAS and/or the Gates-MacGinitie Reading Test (GMRT). Six hundred eighty-nine students in fifth through eighth grade had scaled scores and performance levels from the MCAS. An additional 164 fourth graders had MCAS performance levels only (scaled scores are not given to students in third grade and so were not available to serve as a pre-test for the fourth graders). Seven hundred sixty-five students were evaluated before and after participation on the GMRT. Most of the students were in third through eighth grade, one was in ninth grade. School personnel administered the assessments and reported MCAS and GMRT 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 products are computer-based products that combine an optimal learning environment with a focus on early reading and cognitive skills. The products used by at least 10% of these students in this study (Fast ForWord Language, Fast ForWord Language to Reading, Fast ForWord

Middle & High School, Fast ForWord to Literacy Advanced, Fast ForWord to Reading 2, Fast ForWord to Reading 3, Fast ForWord to Reading 4 and Fast ForWord to Reading 5) include three to seven exercises designed to build skills critical for reading and learning, such as auditory processing, memory, attention, and language comprehension. While there are differences between the products, all help develop certain critical skills as detailed in the following exercise descriptions.

*Circus Sequence*¹, *Sweeps*², *Trog Walkers*³ and *Sky Rider*⁴: 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. The exercises improve working memory, sound processing speed, and sequencing skills.

*Old MacDonald's Flying Farm*¹ and *Streams*²: Students hear a single syllable that is repeated several times, and then interrupted by a different syllable. Students must respond when they hear a change in the syllable. This exercise improves auditory processing, develops phoneme discrimination, and increases sustained and focused attention.

*Phoneme Identification*¹, *IDs*², *Polar Cop*³, *Treasure in the Tomb*³, *Meteor Ball*⁴, and *Lunar Leap*⁴: Students hear a target phoneme, and then must identify the identical phoneme when it is presented later. These exercises improve auditory discrimination skills, increase sound processing speed, improve working memory, and help students identify a specific phoneme. *Polar Cop* also develops sound-letter correspondence skills. *Treasure in the Tomb* also develops grapheme recognition.

*Phonic Match*¹, *Matches*², *Bug Out*³, and *Laser Match*⁴: 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. The *Phonic Match* exercise develops auditory word recognition and phoneme discrimination, improves working memory, and increases sound processing speed. The *Bug Out!* exercise develops skill with sound-letter correspondences as well as working memory.

¹ Exercise from the Fast ForWord Language product.

² Exercise from the Fast ForWord Middle & High School product.

³ Exercise from the Fast ForWord Language to Reading product.

⁴ Exercise from the Fast ForWord to Literacy Advanced product.

Phonic Words¹: and Cards²: Students see two pictures representing words that differ only by the initial or final consonant (e.g., “face” versus “vase”, or “tack” versus “tag”). When students hear one of the words, 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 Builder¹: 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 Commander¹: In Block Commander, a three-dimensional board is filled with familiar shapes that students select and manipulate. The students are asked to follow increasingly complex commands. This exercise increases listening comprehension, improves syntax, develops working memory, improves sound processing speed, and increases the ability to follow directions.

Stories⁴, Start-Up Stories³, and Galaxy Theater⁴: Students follow increasingly complex commands, match pictures to sentences, and answer multiple-choice questions about stories that are presented aurally.

Bear Bags: More Lunch⁵: In this exercise, the participant is asked to help Mama Bear sort words (on pieces of toast) into phoneme-based categories (in lunch bags). It develops phonemic awareness and decoding of single- syllable words. It also develops grapheme/phoneme associations.

Magic Bird⁵: This exercise combines spelling and word-building practice with spelling patterns and word families commonly studied in 2nd 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.

Fish Frenzy⁵: 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.

Leaping Lizards⁵: 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 this exercise.

Dog Bone⁵: 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. Responses are presented as words or short phrases. This exercise develops listening comprehension and working memory skills as measured by performance on multiple choice questions.

Ant Antics⁵: The participant will be presented with a picture and then asked to pick one of the four alternatives that best describes an aspect of that picture. This exercise improves vocabulary skills and sentence comprehension.

Scrap Cat⁶: In Scrap Cat, a series of words is visually presented and participants are asked to sort each word into the correct semantic, phonological, syntactic, or morphological category. For this exercise only, the participant can click a button to hear any word and see it defined. This exercise develops decoding, vocabulary, and word recognition skills.

Canine Crew⁶: In Canine Crew multiple words are presented together in a grid and participants are asked to find pairs that match on the basis of the current criterion. This criterion shifts from words that rhyme, to synonyms, to antonyms, to homophones, as the participant progresses. This exercise develops vocabulary, decoding, and automatic word recognition.

Chicken Dog⁶: Participants hear a word and see it partially spelled. They must complete the word by filling in the missing letter or letter group. Five options are always provided, including options that represent common visual and phonological errors.

⁵ Exercise from the Fast ForWord to Reading 2 product.

⁶ Exercise from the Fast ForWord to Reading 3 product.

This exercise develops basic spelling patterns, letter-sound correspondences, and decoding.

*Twisted Pictures*⁶: Participants are presented with a variety of pictures and asked to select the sentence that most accurately describes each picture from among four alternatives. The descriptive sentences incorporate a wide range of syntactic structures. As the participant progresses, the sentences get longer and more difficult vocabulary is included. This exercise builds sentence comprehension by developing syntax, working memory, logical reasoning, and vocabulary.

*Book Monkeys*⁶ and *Book Monkeys: Book Two*⁷: Participants read narrative and expository passages and answer comprehension questions about each passage. The multiple-choice questions demand that the participant use memory for literal detail, generation of inferences, or grasp of among four alternatives. This task develops paragraph comprehension, inferential and cause-and-effect reasoning, working memory, flexible reading, and vocabulary.

*Hog Hat Zone*⁶ and *Lulu's Laundry Line*⁷: In *Hog Hat Zone*, short passages from classic children's literature are presented, with occasional gaps in the text where words are missing. Participants are asked to fill in each gap with the correct word from among four alternatives. In *Lulu's Laundry Line*, short passages are presented with occasional gaps where punctuation is missing. These exercises develop paragraph comprehension, complex morphology, flexible reading, and vocabulary, as well as automaticity for decoding and sentence comprehension.

*Hoof Beat*⁷: The participant is presented with a question and four possible answers. The participant must choose the most appropriate answer. The questions relate to semantics, phonology, morphology, orthography, and syntax. The exercise encourages flexibility during reading and automatic access to the various dimensions of vocabulary and is designed to build vocabulary by showing the participant how words function.

*Jitterbug Jukebox*⁷: The participant hears a word spoken aloud and letters appear on the keys of a jukebox. The participant must spell the word by clicking on the jukebox keys. *Jitterbug Jukebox* helps participants improve spelling and sensitivity to letter-sound correspondences. This exercise includes many of the 500 most commonly used words in written English including most word families found in 3rd and 4th grade content standards.

*Goat Quotes*⁷: In *Goat Quotes* four newspapers paraphrase a headline at the top of a news kiosk. The participant must select the correct paraphrase. The exercise is designed to sample the basic syntactic (i.e., grammatical) structures of spoken English generally mastered in the early elementary grades. The exercise develops logical thinking and working memory skills as well as careful reading.

*Stinky Bill's Billboard*⁷: Participants must select the word that accurately completes a sentence. In this exercise, participants improve sentence comprehension while practicing the decoding of words in realistic contexts. This exercise also helps build vocabulary and awareness of word structure.

*Wood Works*⁸: In *Wood Works*, the participant sorts written words into sound bins labeled with phonetic (dictionary) symbols. Later the participant sorts spoken words into spelling bins labeled with spelling patterns. In this way, participants build accuracy and fluency in spelling, decoding, and phonemic analysis.

*Lana's Lanes*⁸: In *Lana's Lanes* participants build skills in accurate text comprehension and the use of comprehension strategies by reading fiction or nonfiction passages, completing a graphic organizer or summary of each passage, and answering comprehension questions with and without the aid of the graphic organizers/summaries.

*Quack Splash*⁸: In *Quack Splash* participants build multiple-paragraph passages and demonstrate comprehension of the passages by correctly identifying missing words, phrases, or sentences; by correctly sequencing sentences and paragraphs; and by answering comprehension questions about the completed passages.

*Gator Jam*⁸: In *Gator Jam*, participants complete analogies where one of the 4 terms of the analogy is missing. Later, participants reread the completed analogies, and sort them based on the type of analogical relationship illustrated. In this way, *Gator Jam* helps participants to build skills in critical thinking and abstract reasoning while improving vocabulary.

*Toad Loader*⁸: In *Toad Loader*, participants select sentence segments to correctly build a sentence that describes an illustration. The sentence structures vary in the use of inflections and other grammatical forms. In this way, participants build accuracy and fluency in recognizing and constructing sentence structures.

⁷ Exercise from the Fast ForWord to Reading 4 product.

⁸ Exercise from the Fast ForWord to Reading 5 product

Assessments:

In the spring of 2006 and/or spring of 2007 (before and after using the Fast ForWord products) students' reading skills were evaluated with the reading and math portions of the Massachusetts Comprehensive Assessment System (MCAS). In the fall of 2006 and spring of 2007, students' reading skills were evaluated with the Gates-MacGinitie Reading Tests. Most students were evaluated with both assessments. School personnel administered the assessments, and reported the scores for analysis.

Massachusetts Comprehensive Assessment System (MCAS):

The MCAS is used to evaluate all public school students in Massachusetts, including students with disabilities and limited English skills. It is designed to measure student performance based on the Massachusetts Curriculum Framework learning standards. All students in Grades 3-10 take the MCAS in the spring of each year. As a condition for graduation, students must pass the 10th grade MCAS in English/Language Arts and in Math.

Gates-MacGinitie Reading Tests (GMRT): The GMRT is used to assess a student's decoding, vocabulary, and passage comprehension skills. The tests for third through ninth graders have two components, independently assessing reading vocabulary and comprehension. The two components can be combined to report an overall score.

Analysis:

Massachusetts Comprehensive Assessment System (MCAS) scores were reported in terms of Scaled Scores and Proficiency Level (Warning, Needs

Improvement, Proficient, and Advanced). Scaled scores were analyzed using a repeated measure multivariate analysis of variance (MANOVA). Post hoc paired t-tests were used for further analyses. Gates-MacGinitie Reading Test scores were reported in terms of grade equivalent scores and stanines. Individual subtest scores were not reported. A p-value of less than 0.05 was 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 and attendance level). During the 2006-2007 school year, the Everett Public Schools used the 48- and 50-Minute protocols. These protocols call for students to use the products for 48 or 50 minutes a day, five days per week for eight to twelve weeks. Detailed product use for students with MCAS scale scores is shown in Table 1. Products used by fewer than 10% of the students are not included. Product use information for all students who used Fast ForWord to Reading 5 as well as most of the students who used the other Reading products includes content that was completed after the 2007 administration of the MCAS.

	Number of Students	Days Participated	Number of Calendar Days	Percent Complete	Attendance Level	Participation Level
Fast ForWord Language	195	24	45	83%	82%	99%
Fast ForWord Language to Reading	191	39	83	78%	79%	99%
Fast ForWord Middle & High School	488	27	49	86%	85%	99%
Fast ForWord to Literacy Advanced	476	37	80	84%	80%	98%
Fast ForWord to Reading 2	165	18	47	82%	78%	97%
Fast ForWord to Reading 3	301	23	64	74%	77%	97%
Fast ForWord to Reading 4	450	26	75	78%	76%	99%
Fast ForWord to Reading 5	269	34	118	40%	69%	98%
Total Fast ForWord Product Use	689	107	260			

Table 1. 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: Students often use multiple products. All of the students using Fast ForWord to Reading 5 completed some content after the 2007 administration of the MCAS. Most of the students using other Reading products also used the products after the 2007 administration of the MCAS.

Assessment Results

Massachusetts Comprehensive Assessment Test (MCAS): Scale scores were available from both the Reading and the Math sections of the MCAS for 689 students in fifth through eighth grade. A repeated measures multivariate analysis of variance (MANOVA) showed a significant time by test interaction indicating that there was a difference in the change in scores on the math and reading subtests ($F(1,688) = 102.7, p < 0.001$). Visual inspection indicated that on average, students had higher scores on the Reading test, and that, while there were increases on Reading scores, the Math scores did not change.

Since there was a time by test interaction, paired t-tests were performed to determine the significance of the impact on the two subtests. The t-tests showed that students made significant improvements on their Reading scores indicating that the students' Reading proficiency increased from 2006 to 2007 (Figure 2; Table 2). In addition, Reading achievement levels improved with 32% of the students improving one or more proficiency levels, and the total number of students achieving proficiency increasing from 138 in 2006 to 326 in 2007 (Table 3).

	n	2006		2007		t-statistic
		Mean	SE	Mean	SE	
Reading	689	231.2	0.35	236.0	0.42	13.1*
Math	689	224.5	0.41	224.7	0.43	0.32

Table 2. Students who used Fast ForWord products achieved significant improvement in their Reading scores as reflected by their Scale Score. * $p < 0.05$.

		2007			
		Warning	Needs Improvement	Proficient	Advanced
2006	Warning	28	45	2	0
	Needs Improvement	49	371	217	3
	Proficient	1	32	92	6
	Advanced	0	1	6	0

Table 3. Student levels for 2006 and 2007. The column on the left indicates student level in 2006, the categories across the top indicate their level in 2007. Students on the diagonal were at the same level in 2006 and 2007. Of the 640 student who were at "Needs Improvement" in 2006, 371 were at the same level in 2007, 49 moved down to Warning, 217 moved up to Proficient, and three moved up to Advanced. Students above the diagonal ($n = 273$; 32%) moved up one or more levels. Students below the diagonal ($n = 83$; 10%) moved down one or more levels.

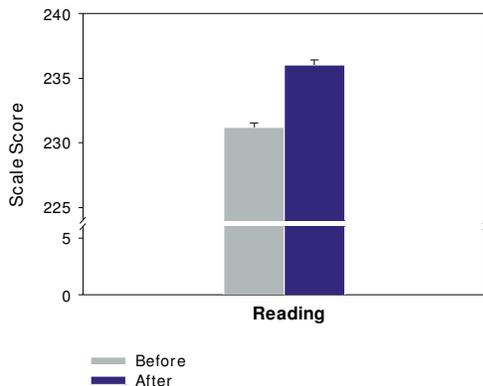


Figure 2: On average, students who used Fast ForWord products made improvements on MCAS scores with significant increases in both the Reading. Results from 689 students are shown here.

In follow-up analyses, the impact of the Fast ForWord products on different subgroups was evaluated. The district provided a variety of demographic data including identifying students receiving services for special education, students from economically disadvantaged families, students attending schools with school-wide Title I programs, and students who were English language learners. In general, average improvements for each of the groups on the MCAS ranged from 2 to 7 points with students who were receiving services, economically disadvantaged, attending a Title I school, or not able to perform typical class work in English initially performing at a lower level than their peers but, on average, achieving gains that were in the same range (Tables 4 – 9).

		2006		2007		
	n	Mean	SE	Mean	SE	t-statistic
Not receiving services	569	232.2	0.38	237.2	0.45	12.8*
Receiving Services	120	226.6	0.76	230.1	0.92	3.8*

Table 4. Students who were not receiving services, as well as students who were receiving services, who used Fast ForWord products achieved significant improvement in their Reading scores as reflected by their Scale Score. * $p < 0.05$.

		2006		2007		
	n	Mean	SE	Mean	SE	t-statistic
Communication Disability	54	227.1	1.25	229.9	1.47	1.99
Specific Learning Disability	49	226.1	1.10	230.4	1.29	3.39*

Table 5. Although there are 13 different classifications for students receiving special education services, only two had enough students (more than 20) for the results to be analyzed separately. Results are shown for students with Communication Disabilities as well as students with Specific Learning Disabilities. * $p < 0.05$.

		2006		2007		
	n	Mean	SE	Mean	SE	t-statistic
Not Economically Disadvantaged	241	232.5	0.61	236.5	0.64	7.1*
Economically Disadvantaged	448	230.6	0.42	235.7	0.55	11.1*

Table 6. Students who used Fast ForWord products who were not economically disadvantaged, as well as students who were economically disadvantaged as defined by receiving free or reduced price lunches, achieved significant improvement in their Reading scores as reflected by their Scale Score. * $p < 0.05$.

		2006		2007		
	n	Mean	SE	Mean	SE	t-statistic
Not Title I School	295	232.4	0.57	235.2	0.62	6.0*
Title I School	394	230.4	0.43	236.5	0.57	12.1*

Table 7. Students at schools with schoolwide Title I programs achieved significant improvements on their Reading Scale Scores as did students in schools without schoolwide Title I programs. * $p < 0.05$.

		2006		2007		
	n	Mean	SE	Mean	SE	t-statistic
Not Limited English	643	231.7	0.36	236.3	0.44	12.1*
Limited English	46	224.3	1.2	231.4	1.5	6.3*

Table 8. Students with Limited English as reflected by their inability to perform typical classwork in English, made significant improvements as did students who were proficient in English. * $p < 0.05$.

		2006		2007		
	n	Mean	SE	Mean	SE	t-statistic
English	411	231.4	0.45	235.9	0.53	9.8*
Haitian/Creole	44	229.4	8.3	233.2	1.6	3.0*
Portuguese	53	232.2	1.2	237.4	1.6	3.9*
Spanish	139	231.0	0.82	236.1	0.95	6.0*
Vietnamese	23	229.9	1.7	239.3	2.8	3.6*

Table 9. Students who used Fast ForWord products spoke one of 19 different languages at home. The five shown above are the ones with enough students for an analysis (at least 20 students). Note that most non-native English speakers are proficient in English and not included in the Limited English Proficient group. * $p < 0.05$.

Gates MacGinitie Reading Test (GMRT): Total reading scores were available for the GMRT. The total reading score is a combination of the Vocabulary and the Comprehension subtests. The 765 students with GMRT scores ranged from third grade to ninth grade with an average grade level of 5.5 (mid way through fifth grade). At the start of the year, the average reading level for the 750 students with grade equivalent scores was 4.7, slightly below the students' grade level; by the end of the year, the students' average reading level was 6.5, or close to grade level (for the end of the year). The results from the GMRT indicate that the students made significant improvements, increasing their grade equivalent scores by 22 months between the start and the end of the school year. Seven hundred sixty-five students had stanine scores; the students' stanine scores increased significantly from 4.2 to 4.7 or one-half a stanine.

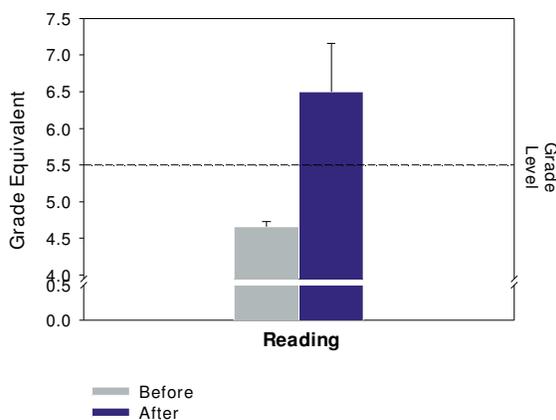


Figure 3: On average, students who used Fast ForWord products made improvements on the Total Reading score of the Gates-MacGinitie Reading Tests. Results from 750 students are shown here.

DISCUSSION

Students in Everett Public Schools made significant gains in their academic achievement following Fast ForWord participation. These improvements are apparent in the analysis of the Reading Scale Scores for the MCAS as well as the GMRT scores.

Across all students in the district with 2007 and 2007 MCAS scores and no identified Fast ForWord product use during the 2006-2007 school year, 13% improved one or more levels, 20% dropped one or more levels. This is in contrast to students who used Fast ForWord products five or more days: 32% went

up one or more levels, 10% dropped one or more levels.

Since the Everett Public Schools used the Fast ForWord products with most of their low performing students, an effort was made to compare students of similar abilities. In 2006, 640 students who were in the Needs Improvement category used Fast ForWord products for five or more days. Sixty-one students in the Needs Improvement category had no identified Fast ForWord product use. Of the students who used Fast ForWord products, 34% moved up into the Proficient category or higher. Eight percent dropped to Warning. Of the 61 students with no identified Fast ForWord product use, 23% improved to a level of Proficient or higher, 16% went down to Warning. Fast ForWord participants in the Needs Improvement category were 50% more likely to become Proficient than their peers who did not use the products.

Although a minimum of five days on an individual product was used to define whether students had used the Fast ForWord products, it is important to note that on average, students in the Everett Public Schools used the Fast ForWord products for 107 days.

The results on the MCAS are reflected in the results on the GMRT. Stanines are grade- and season-corrected such that a student who gains skills at the rate of his or her peers will remain at a constant stanine. A student who does not acquire any new skills during the school year may move down a stanine. In order to move up a stanine, students must acquire skills at a rate greater than that of their peers. Thus, to improve from an average stanine of 4.2 to a 4.7, as the Fast ForWord participants did, indicates that the students who used Fast ForWord improved at a rate greater than their peers, and corresponds to an increase from the 26th percentile to the 34th percentile.

The improvements were not limited to one demographic group but were spread across various groups including students receiving services for special education, students from economically disadvantaged families and students who were not yet proficient in English.

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. The current study reflects significant improvements in academic achievement across a variety of demographic groups. This study supports other studies demonstrating that using the Fast ForWord products strengthens students' foundational skills allowing them to benefit more from the classroom curriculum.

Notes:

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