

# **Improved Academic Achievement and Reading Skills by Students in the Everett Public Schools who used Fast ForWord<sup>®</sup> Products: 2007 - 2008**

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## **ABSTRACT**

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

**Results:** For most of the students in the study, the 2007 – 2008 school year was their second year of Fast ForWord participation. As demonstrated on the 2007 administration of the MCAS, 23% of the study participants were proficient in Reading. By the end of the school year, at the time of the 2008 MCAS administration, the Fast ForWord participants significantly improved their Reading, with 36% of the students achieving proficiency. One-third of the students who were initially at “Needs Improvement” moved into the “Proficient” or “Advanced” level. Of the 735 students in the study who were assessed on the MCAS, 66% improved their MCAS Reading (ELA) score, and 30% moved up one or more categories.

**Study Design:** The design of this study was a multiple school study using high stakes and/or reading tests.

**Participants:** Study participants were 950 students attending elementary, middle, or high 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).

**Keywords:** Massachusetts, elementary school, middle school, high school, urban, observational study, Fast ForWord Language, Fast ForWord Language to Reading, Fast ForWord Literacy, Fast ForWord Literacy Advanced, Fast ForWord Reading Level 1, Fast ForWord to Reading Level 2, Fast ForWord to Reading Level 3, Fast ForWord to Reading Level 4, Fast ForWord to Reading Level 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 started using the Fast ForWord products during the 2006 – 2007 school year and were interested in using the products to evaluate 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. During the 2006 – 2007 school year, Fast ForWord participants significantly improved their

MCAS Reading scores with one-third of the participants in the “Needs Improvement” category reaching Proficiency.

The district was interested in continuing their evaluations and during the 2007 – 2008 school year they used the Fast ForWord Language, Fast ForWord Language to Reading, Fast ForWord Literacy, Fast ForWord Literacy Advanced, Fast ForWord Reading Level 1, Fast ForWord to Reading Level 2, Fast ForWord to Reading Level 3, Fast ForWord to Reading Level 4, and Fast ForWord to Reading Level 5 products.

## METHODS

### Participants

The Everett Public Schools in Massachusetts are located a few miles north of Boston. Serving approximately 5,000 students, the district consists of six schools. Five schools serve students in prekindergarten through eighth grade, and one is a high school. The demographics of the district are rapidly changing with a student mobility rate of approximately 34%. During the 2007 – 2008 school year, 64% of the students in the district were classified as economically disadvantaged (69% of the elementary school students) and 15% were receiving services for special education. Fifty-four percent were English language learners.

Nine hundred fifty students are included in this study and had pre- and post-test scores from the MCAS and/or the Gates-MacGinitie Reading Test (GMRT). Five hundred eighty-one students in fifth through eighth grade had scaled scores and performance levels from the MCAS. An additional 212 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). Eight hundred forty-four students in third through ninth grade were evaluated before and after participation on the GMRT. 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 5% of the students in this study (Fast ForWord Language, Fast ForWord Language to Reading, Fast ForWord Literacy, Fast ForWord Literacy Advanced, Fast ForWord Reading Level 1, Fast ForWord to Reading Level 2, Fast ForWord to Reading Level 3, Fast ForWord to Reading Level 4, and Fast ForWord to Reading Level 5) include five 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*<sup>1</sup>, *Sweeps*<sup>2</sup>, *Trog Walkers*<sup>3</sup> and *Sky Rider*<sup>4</sup>: 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*<sup>1</sup> and *Streams*<sup>2</sup>: 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*<sup>1</sup>, *IDs*<sup>2</sup>, *Polar Cop*<sup>3</sup>, *Treasure in the Tomb*<sup>3</sup>, *Meteor Ball*<sup>4</sup>, and *Lunar Leap*<sup>4</sup>: 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

<sup>1</sup> Exercise from the Fast ForWord Language product.

<sup>2</sup> Exercise from the Fast ForWord Middle & High School product.

<sup>3</sup> Exercise from the Fast ForWord Language to Reading product.

<sup>4</sup> Exercise from the Fast ForWord to Literacy Advanced product.

correspondence skills. *Treasure in the Tomb* also develops grapheme recognition.

*Phonic Match*<sup>1</sup>, *Matches*<sup>2</sup>, *Bug Out*<sup>3</sup>, and *Laser Match*<sup>4</sup>: 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.

*Phonic Words*<sup>1</sup>: and *Cards*<sup>2</sup>: 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 Builder*<sup>1</sup>: 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*<sup>1</sup>: 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.

*Stories*<sup>4</sup>, *Start-Up Stories*<sup>3</sup>, and *Galaxy Theater*<sup>4</sup>: Students follow increasingly complex commands, match pictures to sentences, and answer multiple-choice questions about stories that are presented aurally.

*Bear Bags*<sup>5</sup> and *Bear Bags: More Lunch*<sup>6</sup>: 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) and *Bear Bags: More Lunch* also develops grapheme/phoneme associations.

*Magic Rabbit*<sup>5</sup> and *Magic Bird*<sup>6</sup>: These exercises combine spelling and word-building practice with spelling patterns and word families commonly studied in 1st grade for *Magic Rabbit* and in 2<sup>nd</sup> grade for *Magic Bird*. 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. These exercises develop spelling and sensitivity to letter-sound correspondences.

*Flying Fish*<sup>5</sup> and *Fish Frenzy*<sup>6</sup>: In these exercises, 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. These exercises develop decoding skills, identification of sight words, and auditory memory.

*Quail Mail*<sup>5</sup>: 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*<sup>5</sup> and *Leaping Lizards*<sup>6</sup>: These exercises use 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*<sup>5</sup> and *Dog Bone*<sup>6</sup>: In these exercises, 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 in *Dog Bone*. These exercises develop listening comprehension and working memory skills as measured by performance on multiple choice questions.

*Ant Antics*<sup>6</sup>: 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.

<sup>5</sup> Exercise from the Fast ForWord to Reading 1 product.

<sup>6</sup> Exercise from the Fast ForWord to Reading 2 product.

*Scrap Cat*<sup>7</sup>: 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 Crew*<sup>6</sup>: 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 Dog*<sup>6</sup>: 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. This exercise develops basic spelling patterns, letter-sound correspondences, and decoding.

*Twisted Pictures*<sup>6</sup>: 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*<sup>6</sup> and *Book Monkeys: Book Two*<sup>7</sup>: 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*<sup>6</sup> and *Lulu's Laundry Line*<sup>7</sup>: 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*<sup>8</sup>: 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*<sup>7</sup>: 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*<sup>7</sup>: 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*<sup>7</sup>: 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*<sup>9</sup>: 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*<sup>8</sup>: 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

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<sup>7</sup> Exercise from the Fast ForWord to Reading 3 product.

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<sup>8</sup> Exercise from the Fast ForWord to Reading 4 product.

<sup>9</sup> Exercise from the Fast ForWord to Reading 5 product

comprehension questions with and without the aid of the graphic organizers/summaries.

*Quack Splash*<sup>8</sup>: 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*<sup>8</sup>: 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*<sup>8</sup>: 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.

#### **Assessments:**

In the spring of 2007 and/or spring of 2008 (before and after using the Fast ForWord products) students' achievement was evaluated with the reading and math portions of the Massachusetts Comprehensive Assessment System (MCAS). In the spring of 2007 and spring of 2008, students' reading skills were also 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 10<sup>th</sup> 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 2007-2008 school year, the Everett Public Schools used primarily the 50-Minute protocols. These protocols call for students to use the products for 50 minutes a day, five days per week for eight to twelve weeks. Detailed product use information for students with MCAS and/or Gates-MacGinitie scores is shown in Table 1. Product use information for some of the products includes content that was completed after the 2008 administration of the MCAS. Products used by fewer than 5% of the students are not included (Fast ForWord Language Basics and Fast ForWord Middle & High School).

	Number of Students	Days Participated	Number of Calendar Days	Percent Complete	Attendance Level	Participation Level
Fast ForWord Language	156	48.9	120	84.3	98.9	66.8
Fast ForWord Language to Reading	150	41.7	133	71.5	99.4	64.7
Fast ForWord to Literacy	124	24.2	66	88.3	96.8	64.2
Fast ForWord to Literacy Advanced	100	26.0	78	66.7	98.1	64.6
Fast ForWord to Reading 1	65	21.4	53	90.3	97.1	68.7
Fast ForWord to Reading 2	196	28.2	75	87.0	98.4	66.6
Fast ForWord to Reading 3	326	44.4	127	75.5	98.1	65.6
Fast ForWord to Reading 4	464	43.4	131	76.0	98.2	65.2
Fast ForWord to Reading 5	484	64.1	196	48.3	98.6	65.3
Total Fast ForWord Product Use	950	97.9	287.1			

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. Some students used products and completed content after the 2008 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 573 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 ( $F(1,572) 26.9, p < 0.001$ ).

Since there was a time by test interaction, paired t-tests were performed to determine the significance of the impact on the two subtests: Reading and Math. There were an additional eight students who had either Reading Scores or Math scores who were included in the subtest analysis. The t-tests showed that students made significant improvements between 2007 and 2008 on both their Reading and their Math scores (Figure 1; Table 2). Visual inspection indicated that the improvement was greater on the Reading component.

An analysis of changes in Reading scaled scores indicated that in 2008, 66% of the students improved their score.

Achievement levels were available for 793 students in 4<sup>th</sup> through 8<sup>th</sup> grades (as third graders, students receive only achievement levels, not scaled scores.).

Reading achievement levels improved with 30% of the students improving one or more proficiency levels. The total number of students achieving proficiency increased from 182 in 2007 to 282 in 2008 (Table 3).

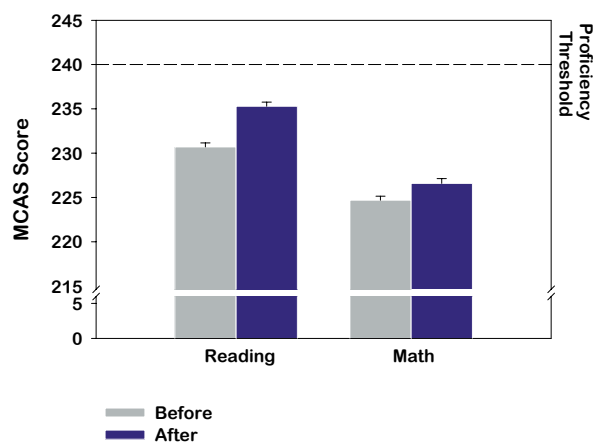


Figure 1: On average, students who used Fast ForWord products made improvements on MCAS scores with significant increases in both the Reading and Math. Reading results from 576 students are shown here.

		2006		2007		
	n	Mean	SE	Mean	SE	t-statistic
Reading	576	230.7	0.45	235.3	0.46	11.6*
Math	578	224.7	0.44	226.6	0.54	4.4*

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

		2008			
		Warning	Needs Improvement	Proficient	Advanced
2007	Warning	41	66	9	0
	Needs Improvement	28	266	141	2
	Proficient	5	47	124	5
	Advanced	0	0	0	1

Table 3. Student Reading (ELA) Achievement Levels for 2007 and 2008. The column on the left indicates student level in 2007, the categories across the top indicate their level in 2008. Students on the diagonal were at the same level in 2007 and 2008. Of the 437 students who were at "Needs Improvement" in 2007, 266 were at the same level in 2007, 28 moved down to Warning, 141 moved up to Proficient, and two moved up to Advanced. Students above the diagonal ( $n = 223$ ; 30%) moved up one or more levels. Students below the diagonal ( $n = 80$ ; 10%) moved down one or more levels. The percentage of students who were proficient or above increased from 23% in 2007 to 36% in 2008.

**Gates MacGinitie Reading Test (GMRT):** Total reading scores were available for the GMRT. The scores were reported in terms of the grade equivalent and is a combination of the student's performance on the Vocabulary and the Comprehension subtests. The 884 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 884 students with grade equivalent scores was 4.8, slightly below the students' grade level; by the end of the year, the students' average reading level was 5.7. The results from the GMRT indicate that the students made significant improvements, increasing their grade equivalent scores by nearly one year between the two tests (Figure 2).

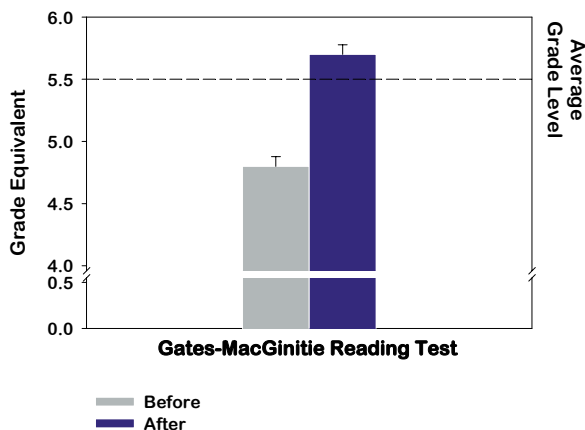


Figure 2: On average, students who used Fast ForWord products made improvements on the Total Reading score of the Gates-MacGinitie Reading Tests. Results from

## DISCUSSION

Students in the Everett Public Schools made significant gains in their academic achievement following Fast ForWord participation. These improvements are apparent in the analysis of both the MCAS Reading Scale Scores and the MCAS Math Scale Scores. Sixty-six percent of the students improved their Reading scaled score by 2 or more points with 30% of the students in the study improving their achievement level. Figure 3 shows a histogram of student MCAS Reading (ELA) scores for 2007 and 2008; students improved significantly with the percentage of proficient students increasing from 23% to 36%. Students with scores above 240 have demonstrated proficiency.

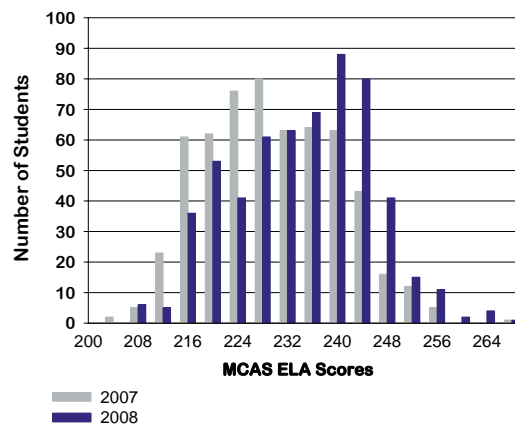


Figure 3: On average, students who used Fast ForWord products improved their MCAS Reading (ELA) score with the number of students achieving proficiency increasing

884 students are shown here.

Most of the students who used the products during the 2007 – 2008 school year and had MCAS Achievement Level information available had also used the Fast ForWord products during the 2006 – 2007 school year (n = 608 or 77%). Students in the second year of the study again achieved significant improvements in their Reading scores. The improvements during the 2007 – 2008 school year were similar to those found during the 2006 – 2007 school year: 4.6 points vs. 4.8 points.

These improvements are helping the district meet Adequate Yearly Progress (AYP). In order to meet AYP in 2008 in Reading, 85.4% of the students had to be Proficient in aggregate, and across each subgroup. Each year a school does not meet AYP both in aggregate, and across all its subgroups, its status is lowered until it is taken over by the state in the 6<sup>th</sup> year.

The high mobility of the students in the district, as well as the large population of English language learners (54% of the students are ELL; 8% are in their first year in the country) make rapid impact especially critical.

In 2006, the year before Fast ForWord implementation, only one of the five elementary schools made AYP for the subgroups and/or in aggregate and due to the school's physical layout, it was reconstituted the following year to serve the most challenged of the students who were receiving services. By 2008, three other elementary schools made AYP for the subgroups and/or in aggregate.

Despite the challenges of the mobile population and the non-native English speaking population, the Everett Public Schools are impacting their students. The Fast ForWord products, with their rapid impact and their focus on building cognitive skills – including phoneme discrimination for phonemes that are common in the English language, but not necessarily other languages – are helping improve the academic achievement of the students.

## 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

from 23% to 36%. Results from 576 students are shown here.

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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