# Improved Language and Reading Skills by Students in the Albuquerque Public School District who used Fast ForWord® Products

**MAPS for Learning: Educator Reports, 8(33): 1-5**


## ABSTRACT

**Purpose:** This study investigated the effects of the Fast ForWord products on the language skills of middle and high school students who used the products within the curriculum in a school setting. **Study Design:** The design of this study was a single school study using nationally normed tests. **Subjects:** Study participants were high school students attending Manzano High School in the Albuquerque Public School District of Albuquerque, New Mexico. A majority of the students were receiving services for special education. **Methods & Implementation:** Before and after participation in the Fast ForWord products, student performance was evaluated with the Diagnostic Screening Test: Reading (DSTR) and the Test of Auditory-Perceptual Skills: Upper Level (TAPS-UL). **Results:** On average, students made significant improvements in their language and reading skills, gaining up to two grade levels after participation on the Fast ForWord products.


**Keywords: New Mexico, public, high school, urban district, special education, observational study, Fast ForWord Middle & High School, Fast ForWord Language to Reading, Diagnostic Screening Test: Reading, Test of Auditory Perceptual Skills (TAPS).**

## 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). Manzano High School was interested in evaluating the effectiveness of this approach as a way for improving the reading curriculum and instruction for their students. In this study, commercially available computer-based products (Fast ForWord Middle & High School and Fast ForWord Language to Reading) were used to evaluate the effectiveness of this approach for improving the language skills of high school students who were struggling with language and reading.

## METHODS

### Participants

The Albuquerque Public School District is a pre-Kindergarten to 12th grade urban school district serving over 88,000 students. Manzano High School, one of the 144 schools in the district, took part in this study. Manzano serves almost 2,000 students in grades 9-12. Fifty-five percent of students are Caucasian and 33% are Hispanic. Approximately 18% receive free or reduced price lunches.

During the 2003-2004 school year, 108 sixth to twelfth grade students with an average grade level of 9.5 used the Fast ForWord products. Seventy-one of the students were receiving special education services; 47 of the students receiving special education services were also receiving speech and language services.

Students had their language skills assessed with the Diagnostic Screening Test: Reading (DSTR) and/or the Test of Auditory-Perceptual Skills: Upper Level (TAPS-UL) before and after Fast ForWord participation. 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 Middle & High School and Fast ForWord Language to Reading products are computer-based products that combine an optimal learning environment with a focus on early reading and cognitive skills. The products include five to six 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, both help develop certain critical skills as detailed in the following exercise descriptions.

*Sweeps*[1]*, and Trog Walkers*[2]*:* 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.

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

*IDs*[1]*, Polar Cop*[2]*, and Treasure in the Tomb*[2]*:* 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.

*Matches*[1]*, and Bug Out*[2]*:* 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 *Matches* 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.

*Cards*[1]*:* 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.

*Stories*[1] *and Start-Up Stories*[2]: Students follow increasingly complex commands, match pictures to sentences, and answer multiple-choice questions about stories that are presented aurally.

**Assessments**
Before and after Fast ForWord participation, students were evaluated with the Diagnostic Screening Test: Reading (DSTR) and the Test of Auditory-Perceptual Skills: Upper Level (TAPS-UL). The school reported scores in terms of grade equivalent scores for the DSTR and standard scores for the TAPS-UL.

**Diagnostic Screening Test: Reading (DSTR):** The DSTR is a battery of tests designed to quickly evaluate a student's reading skills. Two major objectives are to compute Word Reading Levels and Comprehension of Passages Levels. Word Reading includes subtests to measure phonics and word attack proficiency.

**Test of Auditory-Perceptual Skills: Upper Level (TAPS-UL):** The TAPS-UL measures a student's ability to understand and follow directions, recall words, sentences, and numbers from memory, use reason to solve problems, and discriminate word sounds. It is designed for students aged 12 to 18 years old.

**Analysis**
Data was analyzed using a repeated measure multivariate analysis of variance (MANOVA) and dependent t-tests. All analyses used a p-value of 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 2003 – 2004 school year, the Manzano High School used the 90-Minute Fast ForWord Middle & High School and Fast ForWord Language to Reading protocols which call for students to use the products for 90 minutes a day, 5 days a week, for four to eight weeks.

One hundred and eight students from Manzano High School used the Fast ForWord products during the 2003 – 2004 school year and had DSTR and/or TAPS:UL scores from before and after Fast ForWord participation available for analysis. On average,

[1] Exercise from the Fast ForWord Middle & High School product.
[2] Exercise from the Fast ForWord Language to Reading product.

students completed 75% of the product content in a calendar period of 26 days and reached a participation level of 68%. Ninety-six students also used the Fast ForWord Language to Reading product. Detailed usage information by product is shown in Table 1.

Figures 1 and 2 show the average daily progress through the Fast ForWord Middle & High School and the Fast ForWord Language to Reading exercises for all students who had DSTR and/or TAPS:UL scores available. The final day shown on each graph is determined by the maximum number of days that at least two-thirds of the students participated. For students who used the products fewer than the number of days shown, percent complete is maintained at the level achieved on their final day of product use.

| | Number of Students | Average Days | Average Calendar Days | Average Percent Complete | Participation Level |
|---|---|---|---|---|---|
| Fast ForWord Middle & High School | 108 | 14 | 26 | 75% | 68% |
| Fast ForWord Language to Reading | 96 | 14 | 29 | 62% | 63% |

*Table 1. Usage data showing the number of students who used each Fast ForWord product along with group averages for the number of days of use, the calendar days from start to finish, the percentage of product content completed and participation level.*

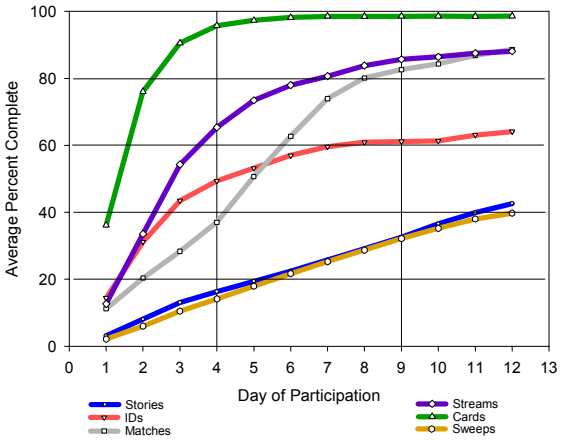


*Figure 1. Average daily progress of students through the Fast ForWord Middle & High School product. Results from 108 students are shown.*

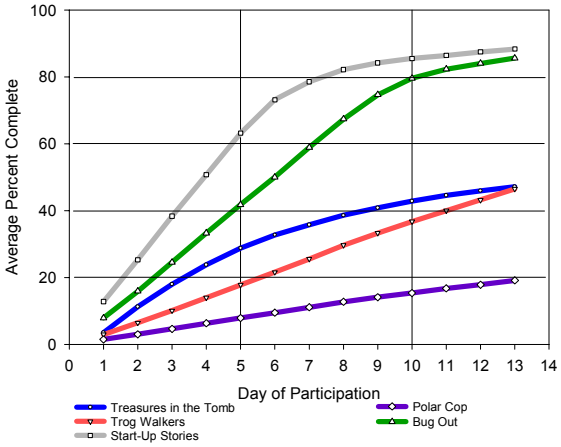


*Figure 2. Average daily progress of students through the Fast ForWord Language to Reading product. Results from 96 students are shown.*

**Assessment Results**

Diagnostic Screening Test: Reading (DSTR): The DSTR was used to evaluate the reading and language skills of students before and after participation on the Fast ForWord products. Scores were reported in terms of a grade-equivalent.

A repeated measure multivariate analysis of variance (MANOVA) between independent assessments reported in terms of grade equivalent scores was used to evaluate DSTR results. The independent tests included Passage Comprehension, Sight Word Reading, and Phonics. It showed that there were significant effects by time, by test and by time by test (Table 2). This indicates that there was a significant difference between performance on the tests before and after using the Fast ForWord products and that the improvements were significantly different between tests. There was also a significant time by test interaction indicating that improvements with time varied by test.

| | df | MANOVA |
|---|---|---|
| Time | 102 | 461.7* |
| Subtest | 101 | 28.7* |
| Time x Subtest | 101 | 37.3* |

*Table 2. Results from a MANOVA show that there were significant improvements over time and subtest. *p<0.05*

On average, before using the Fast ForWord products, students were performing at a fourth grade level (4.3) for reading comprehension and at a sixth grade level (6.3) for word reading skills. The students were in grades ranging from sixth to twelfth grade and had an average grade level of 9.5.

After Fast ForWord use, students made significant improvements, gaining an average of two grade levels in Passage Comprehension and Word Reading (Figure 3).

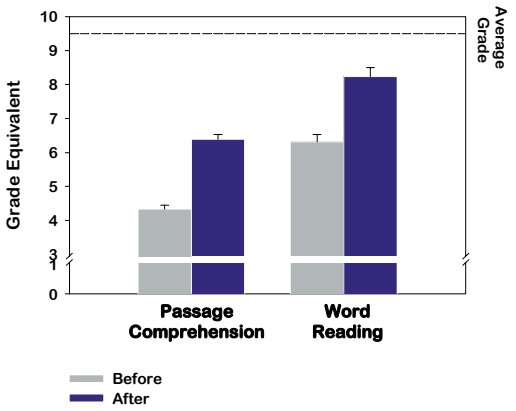


*Figure 3. Overall, students made significant improvements in their reading ability after participation on the Fast ForWord products. The actual average grade-level for the group was 9.5.*

The Word Reading score was a combination of Sight Word Reading, Phonics, and challenging/uncommon word reading. The Sight Word Reading and Phonics subtests have scores that can be reported independently; they are shown below (Figure 4). Students, on average, gained approximately one grade level in reading ability after participation on the Fast ForWord products.

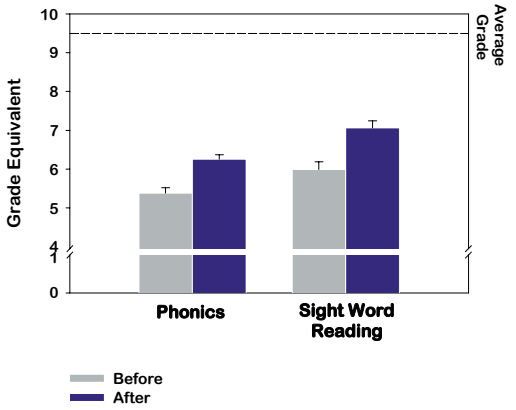


*Figure 4. On average, students gained a year in reading ability as measured by the Word Reading subtests after using Fast ForWord. The actual average grade-level for the group was 9.5.*

Test of Auditory-Perceptual Skills: Upper Level (TAPS:UL): Before Fast ForWord use, students were, overall, in the below average range of the TAPS:UL. On average, after participation, students made significant gains with scores moving closer to the average range (Figure 5).

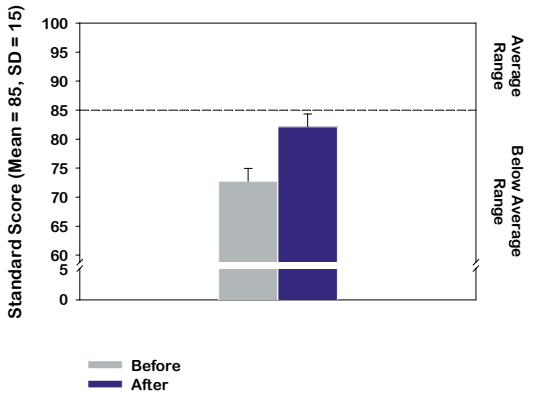


*Figure 5. Standard scores on the TAPS showed that students made significant improvements in their language abilities after using the Fast ForWord products.*

## DISCUSSION

During the 2003 – 2004 school year, middle and high school students at Manzano High School used the Fast ForWord products. The students were very low performing – initially the group was several years behind in passage comprehension and Word Reading. Students made significant improvements on their reading and language skills after participation on the Fast ForWord products. These findings demonstrate that, within Manzano High School, an optimal learning environment coupled with a focus on cognitive and early reading skills can help students attain a higher level of academic achievement.

## CONCLUSION

Receptive and expressive language skills are critical for all students, impacting their ability to benefit from the curriculum, follow instructions, and participate in class discussions. Strong linguistic skills also provide a critical foundation for building reading and writing skills. After using the Fast ForWord products, students improved their reading and language abilities. 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. (2004). Improved Language and Reading Skills by Students in the Albuquerque Public School District who used Fast ForWord Products, MAPS for Learning: Educator Reports, Vol. 8, No. 33: 1-5.

## REFERENCES

Lyon, G.R. (1996). Learning Disabilities. *The future of children: Special education for students with disabilities.* 6:54-76.

Merzenich MM, Jenkins WM, Johnston P, Schreiner CE, Miller SL, & Tallal P (1996). Temporal processing deficits of language-learning impaired children ameliorated by training. *Science*, 271, 77-80.

Miller, S.L., Merzenich, M.M., Tallal, P., DeVivo, K., Linn, N., Pycha, A., Peterson, B.E., Jenkins, W.M., (1999). Fast ForWord Training in Children with Low Reading Performance, *Nederlandse Vereniging voor Lopopedie en Foniatrie: 1999 Jaarcongres Auditieve Vaardigheden en Spraak-taal*. (Proceedings of the 1999 Dutch National Speech-Language Association Meeting).

Tallal P, Miller SL, Bedi G, Byma G, Wang X, Nagarajan SS, Schreiner C, Jenkins WM, Merzenich MM (1996) Language comprehension in language-learning impaired children improved with acoustically modified speech. *Science* 271:81-84.

Gnagey, T. D. & Gnagey, P. A. (1982). *Diagnostic Screening Test: Reading.* East Aurora, NY: Slosson Educational Publications, Inc.