

Improved Reading Skills and Academic Achievement by Gifted and Talented Students 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 and academic ability of elementary school students high-performing or classified as “gifted and talented” who used the products within the curriculum in a school setting. **Study Design:** The design of this study was a multiple school case study using nationally normed assessments. **Participants:** Study participants were elementary school students attending schools in North Carolina or Tennessee. **Materials & Implementation:** Following staff training on the Fast ForWord products, a group of students used the products and had their reading and academic abilities evaluated with the Woodcock Diagnostic Reading Battery (WDRB) or the Tennessee Comprehensive Assessment Program (TCAP) Achievement Tests before and after Fast ForWord participation. **Results:** Overall, students identified as “gifted and talented” significantly improved their cognitive and reading skills following Fast ForWord product use with Phonological Awareness improving from the 58th percentile to the 81st percentile, Decoding skills improving from the 80th to the 88th percentile, and Oral Comprehension Composite improving from the 87th to the 93rd percentile. In a second study, students who were high performers achieved a higher-than-expected level on measures of academic achievement.

Keywords: North Carolina, Tennessee, public, elementary, observational study, gifted, talented, Fast ForWord Language, Fast ForWord Language to Reading, Woodcock Diagnostic Reading Battery (WDRB), Tennessee Comprehensive Assessment Program (TCAP).

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). However, the studies did not address the impact of an optimal learning environment on high performing students.

There are several reasons high performing students might want to improve their foundational skills

including the theory that improved foundational skills, even in a high performing student, might further improve achievement. The school districts in this study were interested in evaluating the effectiveness of an optimal learning environment with a focus on early reading and cognitive skills as a way to improve the reading achievement of students in a school setting. In this study, commercially available computer-based products (Fast ForWord Language and ForWord Language to Reading) were used to evaluate the effectiveness of this approach for improving the reading achievement of elementary school students who were high-performing or classified as “gifted and talented”.

METHODS

Participants

This report focuses on the results from two studies. Participants in Study 1 were elementary school students classified as “gifted and talented” who were assessed with subtests from the Woodcock Diagnostic Reading Battery before and after Fast ForWord product use.

Students in Study 2 were in 4th through 6th grade and were in the top 25% of their class. Prior to and following Fast ForWord participation, they were evaluated with the Tennessee Comprehensive Assessment Program (TCAP) Achievement Tests.

In both cases, 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 products are computer-based products that combine an optimal learning environment with a focus on early reading and cognitive skills. The products used by the school districts, Fast ForWord Language and Fast ForWord Language to Reading, 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 these products, both help develop certain critical skills as detailed in the following exercise descriptions.

Circus Sequence¹ and Trog Walkers²: 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 Farm¹: 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 Identification¹, Polar Cop², and Treasure in the Tomb²: 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 Match¹ and Bug Out²: 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 Words¹: 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.

Start-Up Stories²: 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

¹ Exercise from the Fast ForWord Language product.

² Exercise from the Fast ForWord Language to Reading product.

in Study 1 were assessed with the Woodcock Diagnostic Reading Battery (WDRB). The Achievement Tests of the Tennessee Comprehensive Assessment Program (TCAP) were used to evaluate student academic achievement in Study 2.

Woodcock Diagnostic Reading Battery (WDRB): The WDRB is designed to assess the abilities and achievements of individuals ages 4 through 90 in the areas of basic reading skills, reading comprehension, phonological awareness, oral language comprehension, and reading aptitude. The subtests used in Study 1 were Incomplete Words, Sound Blending, and Word Attack. The Phonological Awareness and Oral Comprehension Clusters were also administered.

TCAP Achievement Tests (TerraNova): The TCAP TerraNova is a set of multiple choice tests that assess five areas: language, reading, social studies, math and science. The school district in Study 2 used a value-added model to set expected test scores based on demographics and students' previous scores.

Analysis

Scores were reported in terms of standard scores for Woodcock Diagnostic Reading Battery and in terms of scale scores for the Tennessee Comprehensive Assessment Program (TCAP) Achievement Tests. All scores were analyzed using a p-value of less than 0.05 as the criterion for identifying statistical significance.

RESULTS

Assessment Results: Study 1

Woodcock Diagnostic Reading Battery (WDRB): On average, after using Fast ForWord products, 23 students classified as “gifted and talented” made statistically significant gains in their Phonological Awareness skills and Decoding skills with the Phonological Awareness Composite improving from the 58th percentile to the 81st percentile, Decoding skills improving from the 80th to the 88th percentile, and Oral Comprehension Composite improving from the 87th to the 93rd percentile (Figures 1 and 2).

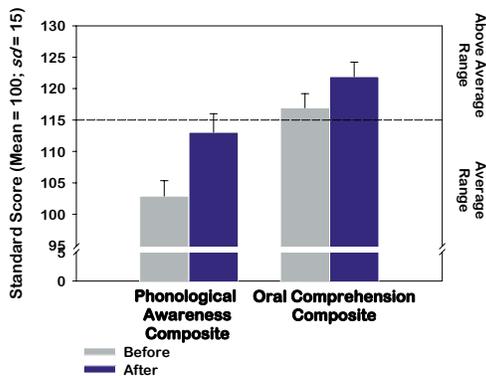


Figure 1. On average, students classified as “gifted and talented” who used the Fast ForWord products significantly improved in phonological awareness skills.

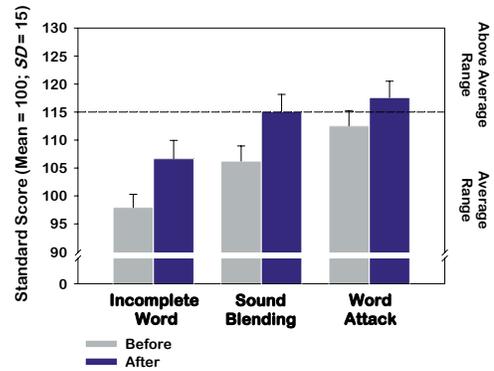


Figure 2. “Gifted and talented” students, on average, also made significant gains in Decoding skills.

Assessment Results: Study 2

TCAP Achievement Tests (TerraNova): On average, students in the top 25% of their class made greater than expected gains on several tests administered as part of their school’s Comprehensive Assessment Program including: Language, Math, Science, and Social Studies. Students, overall, were performing at levels at least one year beyond grade-level and achieved greater than expected improvements following Fast ForWord participation (Figure 3).

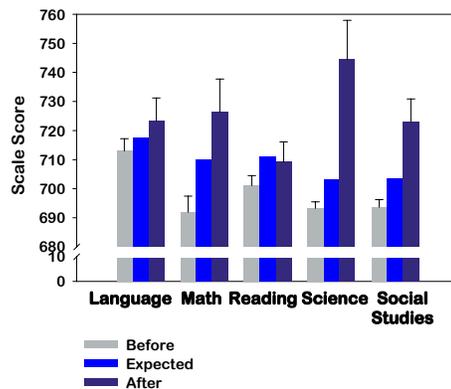


Figure 3. On average, high performing students made greater than expected gains on the TCAP Achievement Tests after Fast ForWord participation.

DISCUSSION

High performing students and those classified as “gifted and talented” who used the Fast ForWord products made significant improvements in cognitive skills, reading skills, and academic achievement. These findings demonstrate that an optimal learning environment coupled with a focus on cognitive skills can help students who are “gifted and talented” or high achieving increase their skills and increase the benefit they receive from their school’s curriculum.

CONCLUSION

Strong cognitive skills are critical for all students, affecting the ability of the curriculum to reach the students. By improving students' memory and attention as well as their ability to sequence sounds, words, or sentences, stronger cognitive skills better position students to take advantage of the opportunities offered to them. Language and reading skills are also 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. After Fast ForWord use, students in this study made significant gains in their reading ability and academic achievement. This suggests that using the Fast ForWord products strengthened the students' foundational skills and better positioned them to continue to benefit from the classroom curriculum.

Notes:

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REFERENCES

CTB/McGraw-Hill (1997). TerraNova CTBS. Monterey, CA: CTB/McGraw-Hill.

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 Logopedie 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.

Woodcock, R. (1997). Woodcock Diagnostic Reading Battery (WDRB). Itasca, IL: Riverside Publishing.