Increased Reading Achievement by Students in Pocatello/Chubbuck School District 25 who used Fast ForWord® Products

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 observational study using state assessments. **Subjects:** Study participants were 150 seventh through tenth grade students who were attending schools in the Pocatello/Chubbuck School District 25 of Pocatello, Idaho. **Methods & Implementation:** Following staff training on the products, schools implemented the study during the 2003 – 2004 school year. Student performance was evaluated with the Idaho Standards Achievement Test (ISAT) comparing results from the administration prior to the study with results from the administration following the study. **Results:** On average, after using the Fast ForWord products, students greatly improved their achievement with scaled scores increasing by 7.4 points – significantly greater than the average nationwide increase of 4.1 points.

Keywords: Idaho, middle school, high school, urban district, observational study, Fast ForWord Middle & High School, Fast ForWord Language to Reading, Idaho Standards Achievement Test (ISAT).

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 Pocatello/Chubbuck School District 25 was interested in evaluating the effectiveness of an optimal learning environment with a focus on reading and language skills as a way for improving reading achievement of students in a school setting. 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 at improving the reading achievement of students.

METHODS

Participants

The Pocatello/Chubbuck School District 25 is a grade K through 12 urban district with 27 schools serving nearly 12,000 students in southeastern Idaho. Eleven percent of students receive special education services and 5% are classified as gifted and talented. Approximately 16% are minority students and 46% have free or reduced price lunches.

In 2003 – 2004, a group of middle and high school students (7th – 10th grades) used the Fast ForWord products. The annually administered Idaho Standards Achievement Test (ISAT) from the Spring, 2003 and Spring, 2004 administrations were used for the evaluation. School personnel administered the assessment 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 these 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 syllable or word, and then must identify the identical syllable or word when it is presented later. These exercises improve auditory discrimination skills, increase sound processing speed, improve working memory, and help students identify a specific sound. *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
Students in the Pocatello/Chubbuck School District 25 had their reading skills evaluated with the Idaho Standards Achievement Test (ISAT) the spring before, and the spring after, Fast ForWord participation.

Idaho Standards Achievement Test (ISAT): The ISAT is a computerized, standards-based state assessment produced by the Northwest Evaluation Association (NWEA). It contains multiple choice questions and is appropriate for grades 2 through 10. The test has reading, language arts, and math sections and is offered in the fall and spring of each academic year.

Once a student completes the test, their score is translated into a proficiency category. These are Advanced (score exceeds standards), Proficient (score meets standards), Basic (score is below standards), and Below Basic (score is critically below standards). A score of Proficient or higher is needed to indicate mastery of a subject.

Analysis
Data was analyzed using repeated measures analysis of variance (ANOVA). 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).

The Pocatello/Chubbuck School District 25 chose to use the non-internet versions of the Fast ForWord Middle & High School and Fast ForWord Language to Reading products. Therefore, product use data was not available for analyses.

One hundred fifty students from the Pocatello/Chubbuck School District 25 used the Fast ForWord products during the 2003 – 2004 school year and had ISAT scores from the Spring, 2003 and Spring, 2004 administrations available for analysis.

Assessment Results
The ISAT scoring system uses Rasch Units (RIT), which represent a unit of knowledge on a numeric scale ranging from approximately 150 to 300. Scores are calculated with a formula using the RIT value of

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

the question and the number of correct answers. School personnel reported these scores for analysis. Nationwide on the NWEA assessment, the 16th percentile for students at the grade-levels included in this study (average grade of 6.6 in Spring, 2003) is 203. Nationwide, average changes in the scaled score for students in the corresponding grades was 4.1 (average improvement varies with grade and ranged from 3.0 to 4.3).

On average, students in the study made significant improvements in reading achievement after participation on the Fast ForWord product, and exceeded their expected increase in scale score (7.4 vs 4.1).

Idaho Standards Achievement Test (ISAT): Before using the Fast ForWord products, the majority of students were, on average, performing in the Below Basic range of the ISAT. Overall, after participation, students significantly increased their ISAT reading scores, improving their reading skills (Figure 1 and Table 1).

	Before		Expected		After		t-statistic
n	Mean	SE	Mean	SE	Mean	SE	
150	204.5	0.93	208.6	0.93	212.0	0.69	4.5

Table 1. After participation, students who used the Fast ForWord Middle & High School and Fast ForWord Language to Reading products showed significant increases in measures of reading achievement. Nationwide, expected increase, year over year, was 4.1 points. Students in the study had an average improvement of 7.4.
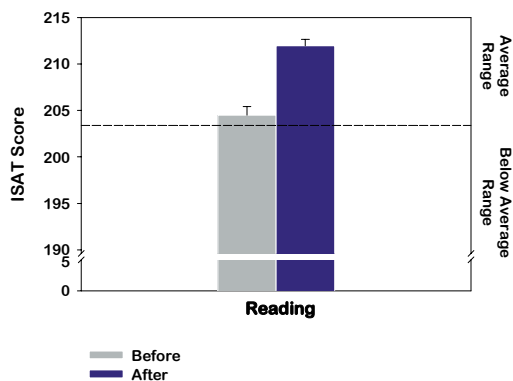

Figure 1. After participation on the Fast ForWord product, the group of 150 students made significant gains on the ISAT exceeding the typical gain of 4.1 for students at similar grade levels. The reference line shows the approximate scaled score level for students in corresponding grades who are below the 16th percentile.

More than half (56%) of the students were in the Below Basic range of ISAT scores before Fast ForWord use. After Fast ForWord participation, the percentage of students performing in the Below Basic range dropped to 27% and students in the Basic range rose from 27% to 49%. Students reaching the

Proficient range (an indication of subject mastery) nearly doubled from 11% to 21% after Fast ForWord use.

DISCUSSION

During the 2003 – 2004 school year, students in the Pocatello/Chubbuck School District 25 used Fast ForWord products. On average, students made significant improvements in their reading skills after using the products.

Before using the products, students, on average, were performing in the Below Basic range of the ISAT reading test. Students, overall, made significant gains in their reading abilities after Fast ForWord participation.

CONCLUSION

Language skills are critical for all students, impacting their ability to benefit from instruction and participate in class discussions. Strong linguistic skills also provide a critical foundation for building reading and writing skills. Scores from before and after Fast ForWord participation show that, on average, students made significant increases in their reading ability. This suggests that using the Fast ForWord products strengthened the students' foundational skills and helped them benefit more from the classroom curriculum.

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