

Improved Language and Reading Achievement by Students in the Grainger County School District who used the Fast ForWord[®] Language Product

MAPS for Learning: Educator Reports, 9(2): 1-4

Purpose: This study compared the academic achievement of students in the Grainger County School District, Tennessee, through the use of the Fast ForWord Language product. **Study Design:** The study used a multiple-school, quasi-experimental design through the use of a nonequivalent control group and a nationally-normed assessment. **Subjects:** Study participants were fifth and sixth graders from four elementary schools in the Grainger County School District. Study participants had assessment scores from the 2000–2001, 2001–2002, and 2002–2003 school years. **Methods and Implementation:** The participant group from the Grainger County School District used the Fast ForWord Language product in the 2002–2003 school year. Before and after the participants used the product, student performance was evaluated by examining the progress on the Terra Nova Comprehensive Tests of Basic Skills. A series of analyses of covariance were used to study differences between the participant and control groups. **Results:** On average, students who used the Fast ForWord Language product scored significantly higher on their language and reading achievement than the control group. Benefits were seen across different variables, including gender and socioeconomic status.

Keywords: Tennessee, elementary school, rural, experimental study, control group, Fast ForWord Language, Terra Nova Comprehensive Tests of Basic Skills.

INTRODUCTION

Numerous research studies have shown that cognitive and oral language skills are underdeveloped 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). G. Greg Marion, of East Tennessee State University, was interested in evaluating the effectiveness of a learning environment with a focus on early reading and cognitive skills as a way for improving the academic achievement of students. As part of a

dissertation, G. Greg Marion worked with schools in the Grainger County School District to evaluate a commercially available computer-based product (Fast ForWord Language) and its effectiveness at improving the academic achievement of students.

METHODS

Participants

During the 2002–2003 school year, 446 students from the rural district of Grainger County, TN, participated in a study. The students were from four different elementary schools within the district: Bean Station, Joppa, Rutledge, and Washburn. The Fast ForWord Language product was provided to all students in three of the schools and was not provided to students in the fourth school. Two hundred seventeen of the 446 study participants were fifth graders, 229 were sixth graders. Fifty-two percent of the students were receiving free or reduced-price lunch.

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 product.

The Grainger County Director of Schools and the Grainger County Technology Director instructed reading teachers in the three Fast ForWord schools to provide the Fast ForWord Language product instead of their regular curriculum. Students therefore used the product during their regular reading period, which varied throughout the day.

Materials

The Fast ForWord Language product is a computer-based product that combines an optimal learning environment with a focus on early reading and cognitive skills. The product includes seven exercises designed to build skills critical for reading and learning, such as auditory processing, memory, attention, and language comprehension. The product helps develop certain critical skills as detailed in the following exercise descriptions.

Circus Sequence: 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: Students hear a single syllable that is repeated several times, and then interrupted by the different syllable. They 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: 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.

Phonic Match: 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.

Phonic Words: 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: 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: 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.

Assessments

To determine the impact of the Fast ForWord Language product, staff within the Grainger County School District looked at student scores on the Terra Nova Comprehensive Tests of Basic Skills. Scores from the product group and the control group were analyzed. The study focused on the five subtests (Language, Reading, Math, Science, and Social Studies) as well as groupings such as gender and socioeconomic status.

Terra Nova Comprehensive Tests of Basic Skills: The Terra Nova is a standardized, nationally-normed test of achievement that is multiple choice and classroom-administered. Subtests include Language, Reading, Math, Science, and Social Studies. The content in the Language and Reading subtests is aligned with contemporary classroom curricula, standards for English/Language Arts, and the conceptual frameworks of the National Assessment of Educational Progress. Tennessee schools test students in

grades three through eight each spring as part of the state mandated Tennessee Comprehensive Assessment Program.

Analysis

For the analysis, Normal Curve Equivalent scores (NCES) and scale scores were used as a source for data comparisons. The study used the 2000–2001 and 2001–2002 Terra Nova assessments as pre-test, and the 2002–2003 assessment as the post-test. The Fast ForWord group and control groups came from the Grainger County School District as intact groups and had similar qualities. If differences between the groups on any major extraneous variable were identified, an analysis of covariance (ANCOVA) was used to statistically equate the groups. For example, when comparing assessment scores on the post-test, the researcher controlled for prior academic differences on pre-tests by using an ANCOVA and controlling for the 2000–2001 and 2001–2002 assessment scores. Statistical analyses used a p-value of 0.05 to determine significance.

RESULTS

Participation Level

Students in the Grainger County School District used the Fast ForWord Language product for a minimum of 90 minutes per day for a minimum of six weeks. At the end of the six weeks, students were required to score 90% on Circus Sequence (one of the seven Fast ForWord Language exercises) or they were required to

continue on the product until they reached a 90% completion level on the exercise. As a result of this standard, some students used the Fast ForWord Language product for eight weeks.

Assessment Results

Terra Nova Comprehensive Tests of Basic Skills:

Study participants in the Fast ForWord group and control group had assessment scores on the five sets of academic achievement measures of the Terra Nova: Language, Reading, Math, Science, and Social Studies. The researcher analyzed the differences in the post-test performances between the groups in these five achievement areas using a series of ANCOVA, controlling for the pre-test scores.

A significant difference was found between the Fast ForWord and control groups on the Language post-test, with the students who used the Fast ForWord Language product scoring significantly higher than the control group. Likewise, there was a significant difference in the Reading post-test between the Fast ForWord participants and the control group. See Table 1 for details. Significant differences were not found on the other three subtests of the assessment. Due to the findings of these analyses, this summary will only report results on the Language and Reading subtests.

Subtest	Intervention	n	Post-Test Adjusted Mean	Post-Test Mean	SD	F	p
Language 2003	No FFW	120	660.30	664.07	39.66	17.08	0.000*
	FFW	201	680.78	678.52	41.38		
Reading 2003	No FFW	134	651.76	652.25	38.28	11.26	0.001*
	FFW	215	661.38	661.07	35.44		

Table 1. ANCOVA results show that students who participated on the Fast ForWord Language product scored significantly higher than the control group on the Language and Reading 2003 post-test, while controlling for pre-test scores. * $p < 0.05$

ANCOVA analyses of the interaction of gender and intervention group (Fast ForWord or control) did not show statistically significant results in Language or Reading, indicating that the results within the intervention groups on these subtests of the Terra Nova were seen across gender. Different ANCOVA analyses indicated that within the intervention groups, results were also seen across socioeconomic status (whether

students received free/reduced-price lunch or full-price lunch).

Students who used the Fast ForWord Language product used the product at different times of the school year, first semester and second semester. The researcher wanted to analyze the differences in post-test performance based on the time of year of Fast ForWord participation. Controlling

for pre-test scores, the ANCOVA revealed that there was no significant difference in the Language or Reading subtests between the first semester and second semester Fast ForWord participants, indicating that the students from the two participation times scored similarly at post-test.

A further analysis investigated whether there were systematic differences in performance between student ability groups. Dividing the study participants into four ability groups based on their 2002 Terra Nova scores (1st, 2nd, 3rd, and 4th quartiles), there were no significant ability group differences on the 2003 post-test while controlling for the 2001 and 2002 scores. An additional analysis was performed to determine whether an interaction between the four ability groups and the intervention group (Fast ForWord or control) occurred. For this analysis, the Language and Reading subtests were used to create separate ability groups from the 2002 data. No interaction was found in the Reading subtest. Results did, however, indicate a significant difference in the performance of students on the Language subtest of the 2003 Terra Nova while examining interaction of ability group and intervention group ($p = 0.04$).

CONCLUSION

Students in the Grainger County School District were divided into two groups: students who used the Fast ForWord Language product and students who did not. All study participants had Terra Nova Comprehensive Tests of Basic Skills assessment scores.

As the researcher, G. Greg Marion, concludes, “there appeared to be a positive relationship for the students who received the intervention, specifically in the areas of reading and language”, which refers to the significant differences between the two groups of students in the mean Language and Reading post-test scores. These positive results in language and reading achievement were seen across various variables, including gender, socioeconomic status, time of Fast ForWord participation, and ability level.

Language skills are critical for all students, impacting their ability to benefit from instruction, follow instructions, and participate in class discussions. Strong linguistic skills also provide a critical foundation for building reading and writing skills. The results from this study

support previous studies, demonstrating that using the Fast ForWord Language product strengthens students’ foundational skills and helps them benefit more from the classroom curriculum.

Notes:

To cite this report: Scientific Learning Corporation. (2004). Improved Language and Reading Achievement by Students in the Grainger County School District who used the Fast ForWord® Language Product, MAPS for Learning: Educator Reports, Vol. 9, No. 2: pp. 1-4.

REFERENCES

- CTB/McGraw-Hill (1997). Terra Nova 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.
- Marion, G.G. (2004). An Examination of the Relationship Between Students’ Use of the Fast ForWord Reading Program and Their Performance on Standardized Assessments in Elementary Schools. Doctor of Education dissertation, East Tennessee State University.
- Merzenich M.M., Jenkins W.M., Johnston P., Schreiner C.E., Miller S.L., & 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 S.L., Bedi G., Byrna G., Wang X., Nagarajan S.S., Schreiner C., Jenkins W.M., Merzenich M.M. (1996). Language comprehension in language-learning impaired children improved with acoustically modified speech. *Science* 271:81-84.