



Examination of Gains in Reading
Proficiency by Students Training on the
AutoSkill Academy of READING®
Software Intervention Program
in the Chambersburg Area School District
2001-2002 School Year

Dr. Eric Michael¹, Connie Strunk²

¹ Chambersburg Area School District, Assistant Superintendent, Chambersburg, PA

² Chambersburg Area School District, Reading Supervisor, Chambersburg, PA
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Highlights

- ❖ Eighth grade students training on the Academy of Reading showed statistically significant gains of 2.4 grade levels on the Stanford Diagnostic Reading Test after 11.5 hours of time on task in the program.
- ❖ 92% of students showed gains on the Stanford Diagnostic Reading Test and 82% showed gains on the Cloze paragraph reading test.
- ❖ Following training on the Academy of Reading, 65% of students demonstrated scores at or above the eighth grade level on the Stanford Diagnostic Reading Test. No students scored above grade level prior to training.

The Study and Results

Study

The effectiveness of the AutoSkill Academy of Reading program in developing basic reading skills in a group of eighth grade students was evaluated.

Academy of Reading Program

The Academy of Reading is a research-based intervention program designed to supplement a reading curriculum by developing essential component reading skills in K-12 students. The AutoSkill Academy of Reading program promotes the acquisition of basic reading skills through a rigorous training program that is based upon extensive research in the areas of neuroscience, neuropsychology and educational psychology. Students receive extensive training in order to master a range of basic reading skills to such a degree that the skills become "automatic"¹. These essential reading skills include phonemic and grapho-phonemic awareness, phonics, fluent and accurate decoding, and important comprehension skills.

Student Training and Evaluation

Effectiveness of the Academy of Reading in promoting reading skills was examined in a group of eighth grade students enrolled in Faust Junior High School in the Chambersburg Area School District during the 2001 - 2002 school year.

Students identified as having at least two years of reading delayed problems were trained on the Academy of Reading program for three 40 minute sessions per week for the duration of the school year.

Altogether, standardized test score data were collected from 82 students that trained on the Academy of Reading. A total of 60 students completed the Cloze Paragraph Reading Test prior to training and once again following training. Forty-eight students completed the Stanford Diagnostic Reading Test before and after training. These test scores provide an excellent measure of the degree of gains in reading proficiency demonstrated by students training in the Academy of Reading. Twenty-six students completed both tests.

¹ See Appendix A for more information on the role of automaticity in developing readers.

Student Training Progress

Time in training

On average, students completed 11.5 (+/-3.5 st. dev.) hours of direct training on the Academy of Reading. This duration excludes the time that students may have spent logged into the Academy of Reading but were not actively training. Students spend approximately 50% of their time directly working to master reading skills while the other half of the time is spent on activities such as reviewing their results and awards, or reviewing training videos. The data indicates that 2/3 of the students spent between 16.0 and 30 hours on the Academy of Reading program during the school year.

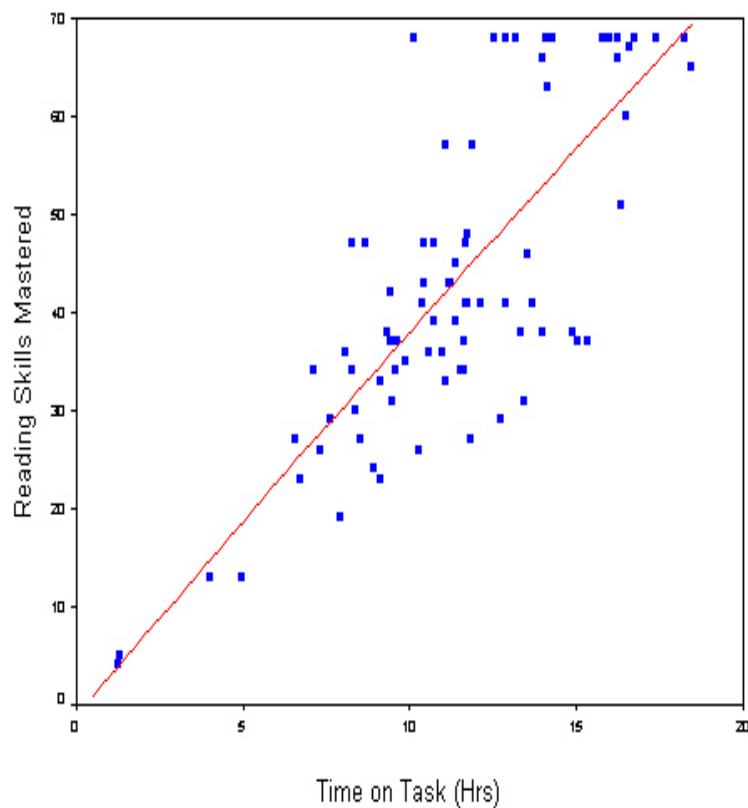


Figure 1: Illustration of the relationship between time on task and reading skills

Reading Skills Mastered

The number of reading skills successfully mastered by students training on the Academy of Reading provides a good measure of their achievement.

The total number of reading skills mastered ranged from 4 to 68. On average, students mastered 43.5 skills at a rate of 3.8 skills per hour. Students trained on the Academy of Reading program for an average period of 28 weeks (ranging from 9 to 33 weeks; +/- 6.0 weeks). The rates of skills mastered per hour of training ranged from 2.3 to 6.7. Figure 1 provides an illustration of the distribution of skills mastered and the total time on task. Students showed an excellent rate of training progress, which is a good indication of a properly implemented training program.

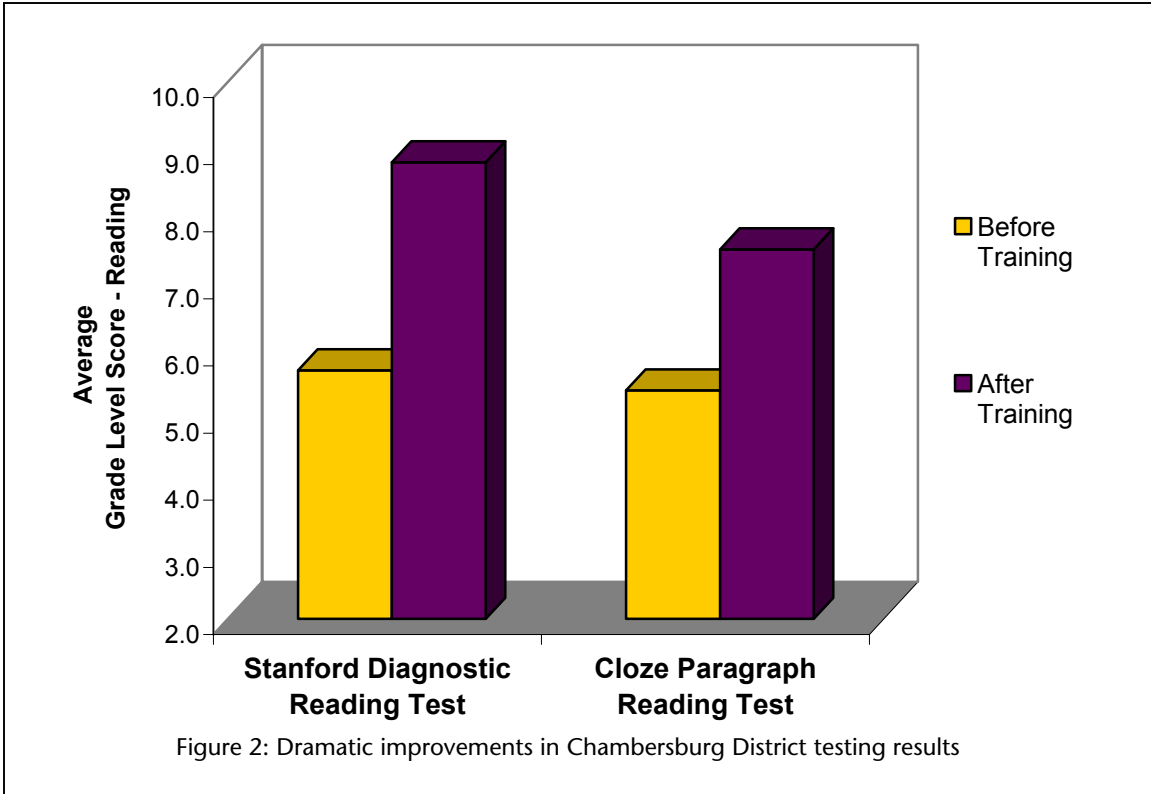
Student Gains on Recognized Reading Tests

Stanford Diagnostic Reading Test

A total of 48 students completed the Stanford Diagnostic Reading Test. Prior to training on the Academy of Reading, these students demonstrated an average reading grade level of 5.7. The average reading level increased to 8.1 following training (Figure 2). Statistical analysis comparing students' pre-training Stanford Diagnostics Reading Test scores with their post-training scores using a paired t-test revealed a statistically significant increase of 2.4 grade levels ($t=10.5$, $df = 47$, $p < .0001$). Ninety-two percent (44 out of 48) of the students showed gains on the Stanford Diagnostic Reading test; 83% demonstrated gains of more than one grade level! Five students showed gains of less than one full grade and three students showed decreases in reading scores.

Prior to training on the Academy of Reading, no students scored at or above eighth grade level. Initial reading levels ranged from grades 3.2 to 7.7. Following training, 65% (31 out of 48) of the students demonstrated levels of reading proficiency at or above their grade level. Thirty-one percent of the students (15 out of 48) demonstrated reading levels greater than the eighth grade!

Of the remaining 17 students that did not achieve an eighth grade reading score, 14 showed gains in reading scores ranging from .10 to 3.5 years with an average gain of 1.5 years.



Cloze Paragraph Reading Test

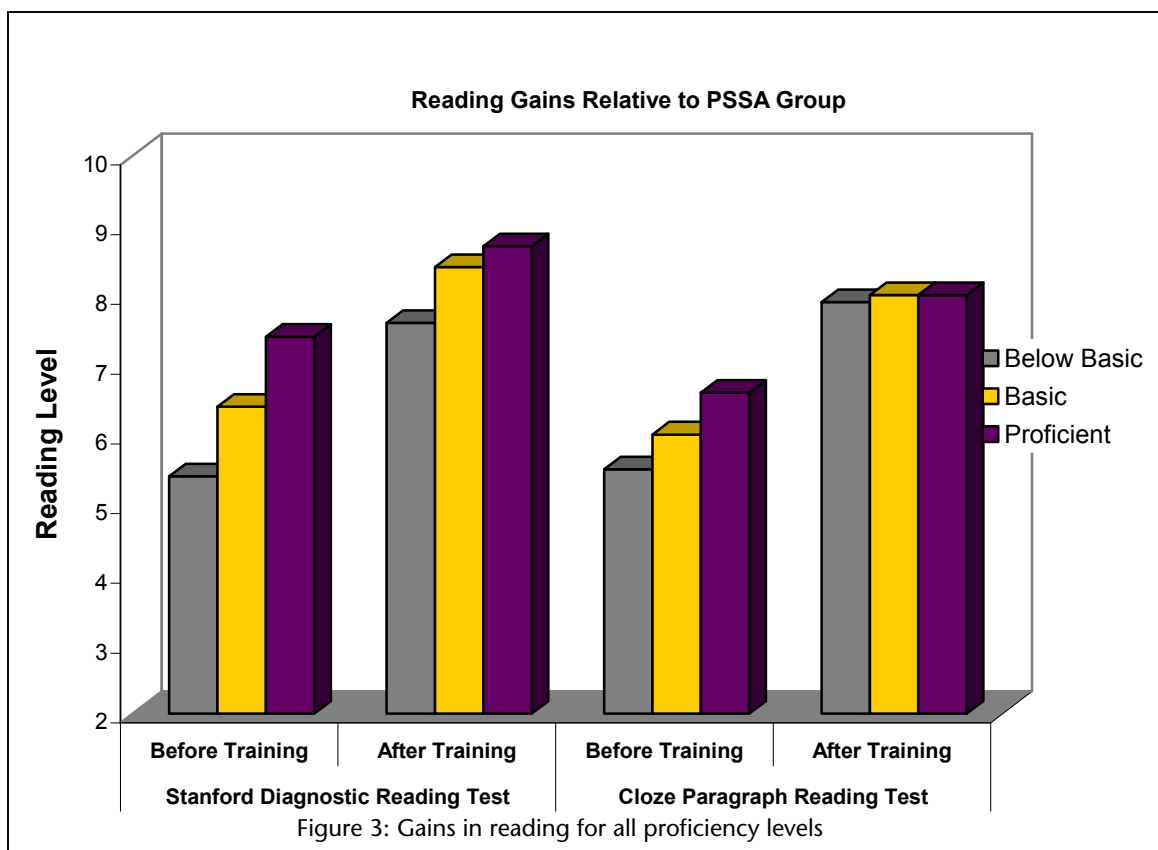
Students also demonstrated similar gains in reading proficiency levels when their scores on the Cloze Paragraph Reading Test were analyzed.

On average, students demonstrated a reading level score of 5.4 prior to training. Reading level scores increased an average of 2.1 levels to an average post-training reading level of 7.5. Comparison of the student's pre- and post-training test scores revealed a statistically significant increase in reading level following training ($t = 9.1$, $df = 59$, $p < 0001$). Prior to training, seven students (12%) scored at grade level; following training, 50% of students scored at or above grade level. Eighty-two percent of students demonstrated gains on the Cloze Paragraph Reading Test of one level or more.

Gains for All Levels of Readers

Gains in reading proficiency were examined in relation to the students' initial level of reading ability as measured by the Pennsylvania System of School Assessment (PSSA). Students training on the Academy of Reading demonstrated gains in reading level on both the Stanford Diagnostic Reading Test and the Cloze Paragraph Reading Test irrespective of PSSA reading group (Figure 3).

Students in all PSSA reading levels are represented in this study (Below Basic, Basic, Proficient and Advanced). The first three groups demonstrated gains of 2.3 to 2.5 grade levels on the Stanford Diagnostic Reading Test. Only one student was classified as reading at an Advanced level on the PSSA. This student showed gains of three grade levels on the Cloze Paragraph Reading Test.



Students in the Below Basic reading level group showed substantive gains of 2.3 levels on the Cloze Paragraph Reading Test. The Basic Reading Level PSSA group showed gains of 1.9 levels on the same test. The Proficient reading level group showed significant gains of 1.4 grade levels on the Cloze Paragraph Reading Test. It should be noted that one student in the proficient group initially scored 8.0 on the pre-training Cloze Paragraph Reading Test and 4.0 on the post-training assessment. The same student scored 8.5 on the post-training Stanford Diagnostic Reading Test. For the purposes of the "group gains" illustration in Figure 3, the post-training score for that student was made equivalent to the pre-training score, thus reflecting no gain rather than a substantive reduction in reading ability.

Discussion

Analysis of the training and test information of students training on the Academy of Reading revealed that students in this study were able to achieve gains of 2.4 grade levels on the Stanford Diagnostic Reading Test and 2.1 levels on the Cloze Paragraph Reading Test. A review of the training data showed that the students were able to achieve sufficient amounts of time on task training in order to master a significant number of basic reading skills. This hallmark feature of a well-implemented Academy of Reading training program is reflected in the gains in reading proficiency shown by the students.

Ninety-two percent of students showed gains in their reading level on the Stanford Diagnostic Reading Test. Prior to training on the Academy of Reading, no students were able to read at or above the eighth grade level as measured by the Stanford Diagnostic Reading Test. Following training, 65% of these students were able to read at or above the eighth grade level with 31% reading above the eighth grade level. These results clearly demonstrate that it is possible to significantly increase the reading proficiency of struggling students with relatively little training on the Academy of Reading.

While not all students were able to demonstrate post-training Stanford Diagnostic Reading Test scores at or above reading level, it was clear that most students showed substantive gains in reading proficiency. Eighty-three percent of the students demonstrated gains of one grade level or more. Comparison of students' gains in the reading level groups identified by the PSSA indicated that each group achieved average gains in reading proficiency of 2.5 levels.

Analysis of the Cloze Paragraph Reading Test results showed a pattern of gains in reading proficiency that mirrored the Stanford Diagnostic Reading Test data. Eighty-two percent of students demonstrated reading level gains of one year or more.

Overall, these results demonstrate that students were able to achieve significant gains in reading performance following training on the Academy of Reading.

Appendix A

Automaticity

Initially, basic reading tasks require a high degree of cognitive effort to perform. However, once learned, these tasks become automatic and require fewer cognitive resources. "Automaticity" is established through repeated trials that strengthen the neural connections involved in mediating basic reading task skills. To master an exercise that teaches reading sub-skill in the Academy of Reading, students must not only meet an accuracy criteria (percent correct), but they must also achieve a consistent and rapid response pattern that is the hallmark of a task that has been learned to an "automatic" level. Once a task has become automatic, the student has more cognitive resources available to devote to other higher-level components of the reading process, such as comprehension. The Academy of Reading also provides training that promotes reading comprehension once a number of basic reading skills have been mastered.