

## **"Do Screen Readers Help Young Students Who Have Learning Disabilities?"**

Presentation at the 17th annual conference  
Closing the Gap: Computer Technology in Special Education and Rehabilitation  
October 22, 1999  
Minneapolis, Minnesota.

## Introduction:

This study was conducted during the spring and summer of 1999. The purpose was to investigate the potency and feasibility of using screen reading technology with young, struggling readers. The main question being asked was whether this technological intervention would replicate findings of improved reading skills documented by a body of research during the 1970's and 80's on the Neurological Impress, echo reading, paired reading, assisted reading, and other sight-sound match approaches for teaching reading. The early research indicated that poor readers who used these types of methodologies for 15 minutes/day showed "dramatic improvement" after they had read for a total of 8-12 hours.

## Sample and Procedure:

The sample population was drawn through classroom teachers, school diagnosticians, and parents in three towns in Midwestern states. The criteria required that the student be 8-10 years old, in 2nd, 3rd or 4th grade and have a diagnosed learning disability or dyslexia. Initially, 43 students registered to participate in the study; only nine completed the required reading and furnished test results. Some students in the sample group were identified as having ADHD as their primary disability.

## Sample Characteristics

- Child is 8-10 years old and in second, third or fourth grade.
- Child has recognized learning disability or dyslexia.

Name	Age	Study Term	Hours Read
Joe	10 years	7 weeks	6:58
Kayleigh	8 years	7 weeks	5:50
Josh	10 years	7 weeks	5:41
Jeremy	10 years	8 weeks	28:45
Desmond	10 years	7 weeks	3:47
Jenny	10 years	7 weeks	11:00
Cameron	8 years	6 weeks	3:25
Heather	9 years	6 weeks	4:25
Keaton	10 years	6 weeks	4:05

The students used screen readers for 15 minutes every school day over an eight week period to "read" a series of 20 adventure stories. Each page of text was displayed on the computer screen along with an illustration to emulate a typical storybook in print format. The reading software read the text aloud to the student through personal headphones while simultaneously highlighting each word on the screen. The student was able to navigate through the story by "turning the page" with a click of the mouse.

At the outset, a carefully controlled set of sight words and key phrases acquainted the students with the story line and characters. The final story presented them with

vocabulary, sentence structure and literary concepts consistent with a 5th grade reading level. An activity diary was used to log the date and duration of each session and the book each student read. The prescribed formula for session length and consistency, as well as the style of reading material, conformed to descriptions provided in the early studies.

## Data and Design:

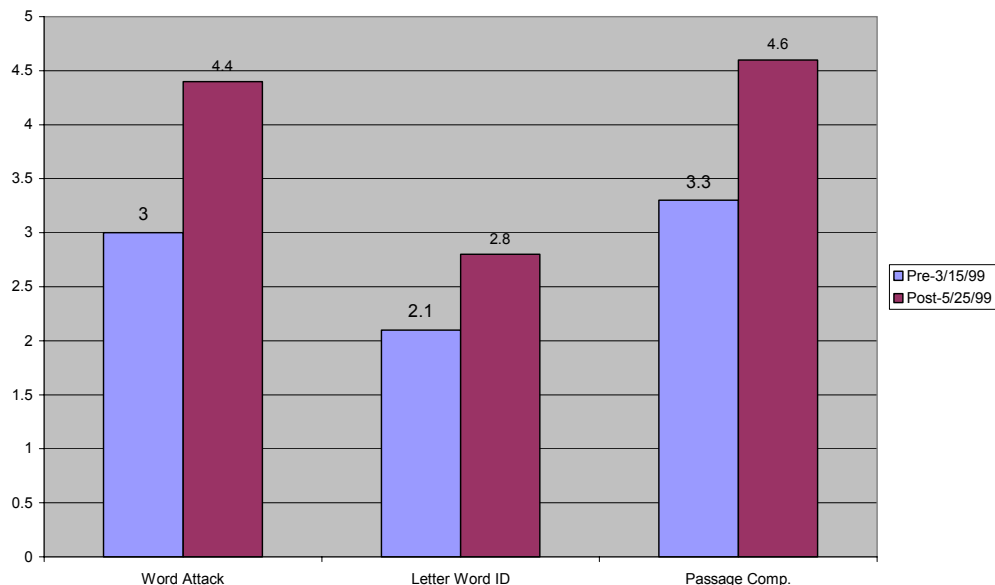
Qualified professionals administered the Woodcock Johnson-R (equivalent forms) to students before and after they experienced reading with the screen reader. This testing instrument provides a standardized measurement of several reading skills. Informal interviews with students, parents and teachers were also conducted to explore additional academic and social outcomes for participants. The data was first analyzed by charting each student's pre/post test performance on the WJ-r in three subtests (Letter/Word ID, Word attack and Passage Comprehension) to determine any change in these skills. Whenever possible, the student's historical test performance on the WJ-r was also included in this analysis. Next, the student's performance on the WJ-r was cross referenced with his/her activity diary to examine possible relationships between test performance and reading behavior (consistency, duration). Finally, the student's performance on the WJ-r was evaluated in the broader context of the interviews.

## Conclusions:

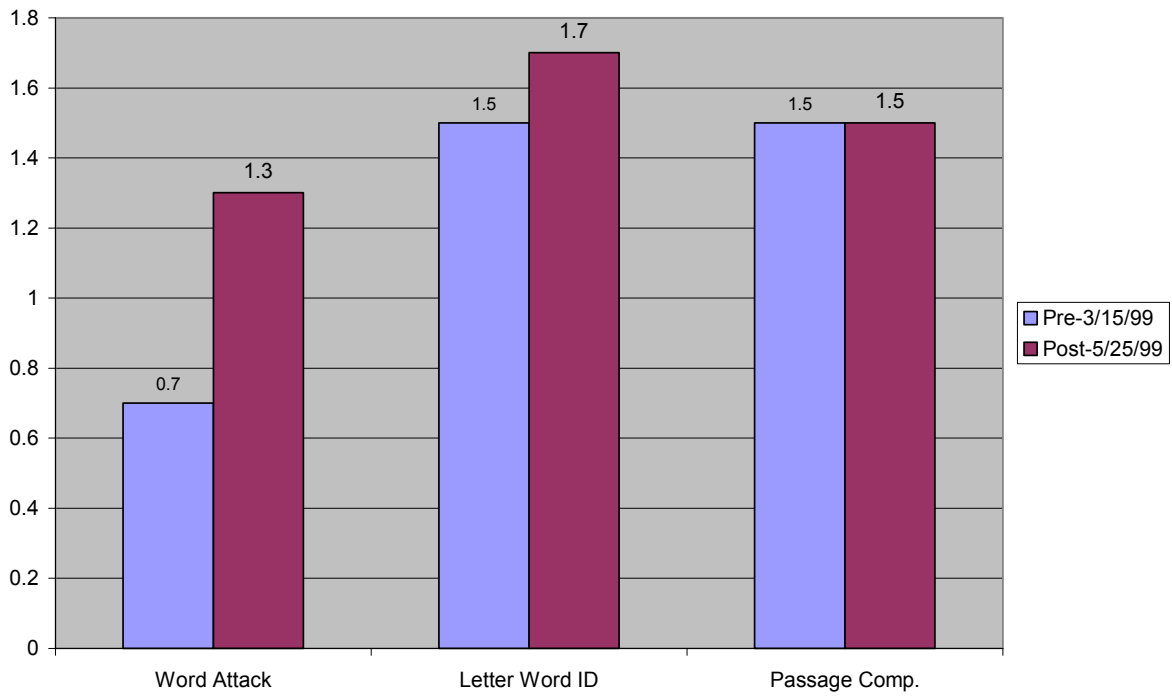
During this study, all students made gains in reading as measured by the WJ-r. In most cases they gained at a faster rate than they previously had with other interventions and their gains exceeded the time they had spent reading in the study. This concurs with the finding of the National Reading Summit (1999) that regardless of the theoretical model used to teach reading, technology is one technique that improves outcomes for students.

## Examples

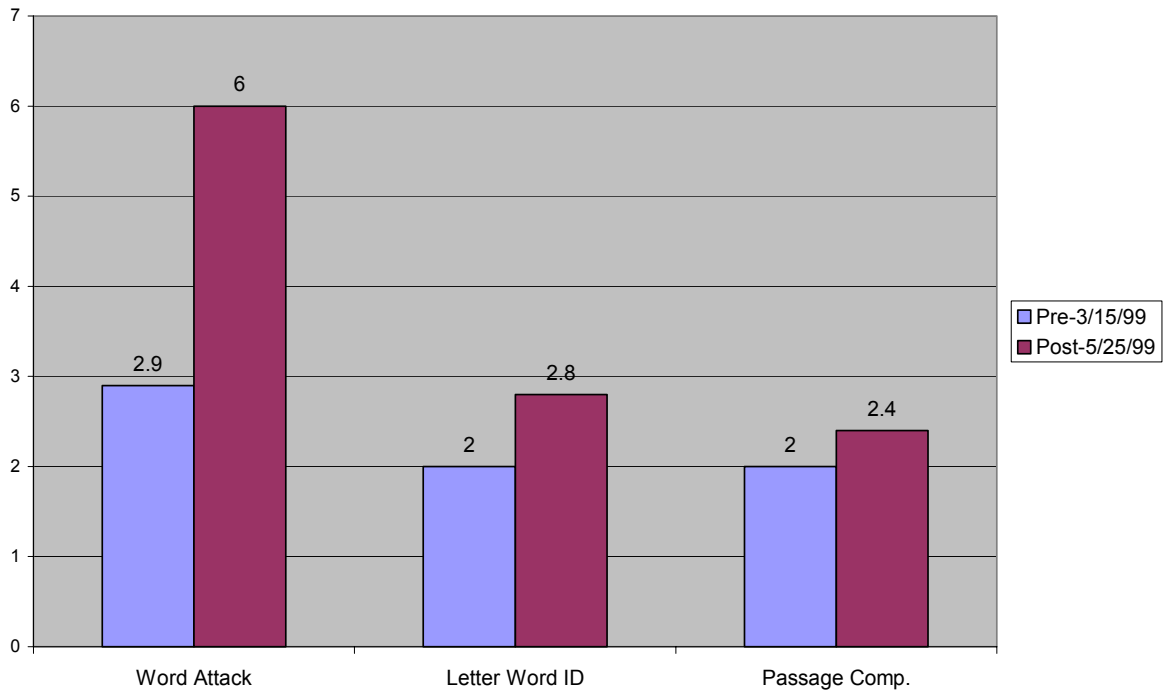
### Joe's Results



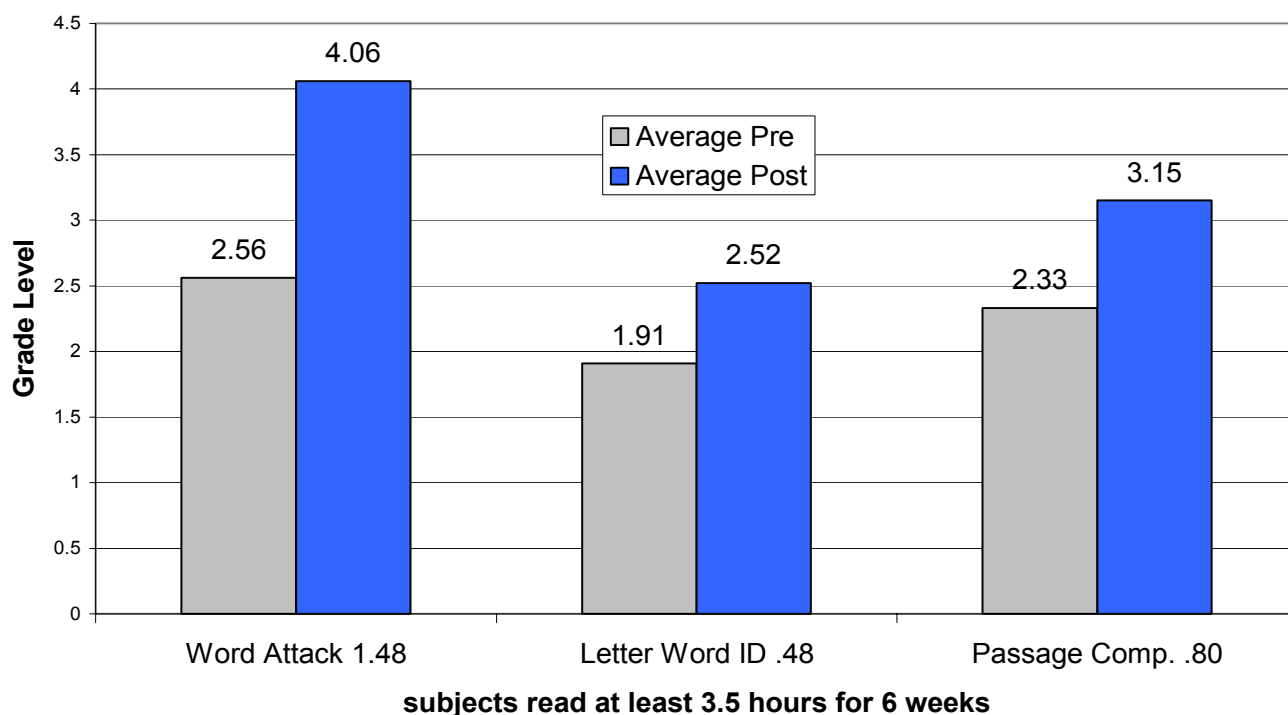
### Jenny's Results



### Jeremy's Results



## Reading Achievement

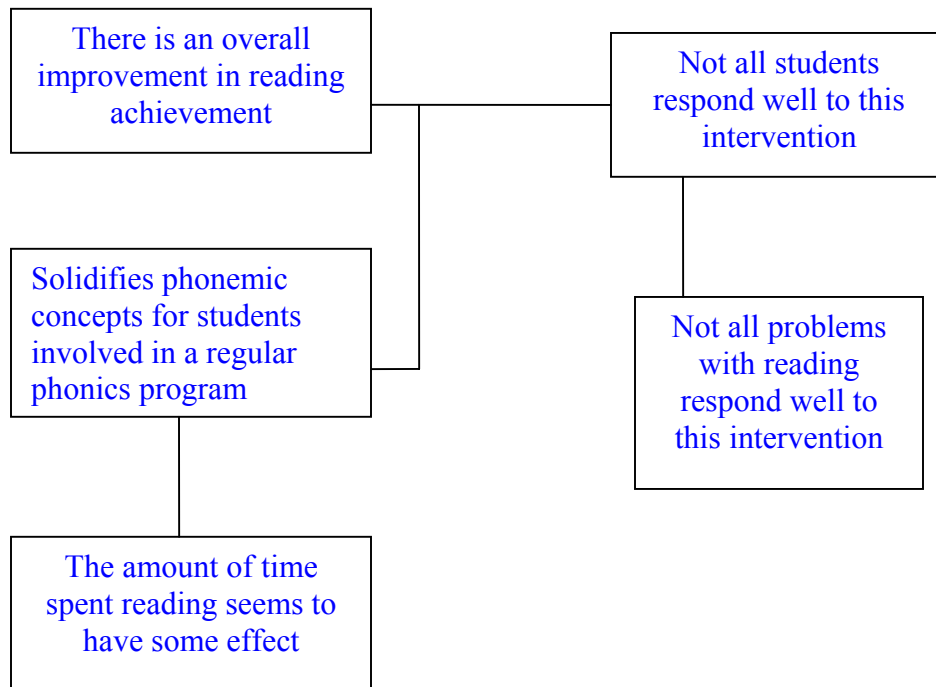


Of the reading subtests analyzed, students made the largest gain in word attack. This was surprising since the reading material, although structured to build fundamental reading skills and enhance linguistic awareness, offered no direct instruction in phonics. Further analysis led to the hypothesis that the technology, in some unknown way, had helped students integrate previous phonics training with whole word understanding.

The gains students made did not seem to correspond to the time they spent reading. The students in this study made rapid gains, with the "break over" point for improvement occurring around the total reading time of four hours. Furthermore, those students who spent a relatively short time reading gained as much as other students who spent much longer and vice versa.

In general students, teachers and parents reported that this technological method was highly motivating for students and boosted their self esteem. The computer screen helped students with ADHA focus their attention and the headphones helped eliminate distractions, but the intervention did not completely overcome their reading problems. Furthermore, this type of intervention may not be appropriate for students with visual/auditory processing problems or visual or hearing difficulties.

## Summary:



This study, although small, indicates that screen reader technology does help many struggling readers improve their reading skills and it can be used to replicate multisensory approaches for teaching reading such as the Neurological Impress Method and paired reading. The improvement in students' word attack skills suggests that the consistent sight/sound match the screen reader provides somehow powerfully reinforces phonics instruction for children who have learning disabilities or dyslexia. The effectiveness coupled with the overall simplicity of this intervention is encouraging. It is easy to incorporate in a classroom; it is a short term intervention; it is student driven; it reduces the need for teacher modifications; and it fosters the enjoyment of reading.

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