

Running head: ASSISTIVE TECHNOLOGY AND WRITING

How Does the Use of Read and Write GOLD Software
Affect Writing Products Produced by Middle School Students with Special Needs?

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Abstract

This 5 week study focused on the effect of assistive technology (AT) on writing products of students in 2 self-contained special education classes of 2 middle school teachers in an East coast metropolitan area. Students in this study used AT during the writing process. Correct Word Sequences (CWS) and gain scores were compared from pre-test and post test writing samples using a CWS scoring guide from the University of Minnesota (2005) and rubric for total score that calculated spelling accuracy, inclusion of introduction, detail, and conclusion sentences of paragraphs, and end punctuation. Although the number of participants was small, the positive gain scores found for the percentage of increase in numbers of words typed and the percentage of increase in the total rubric gain score were remarkable.

How Does the Use of Read and Write GOLD Software

Affect Writing Products Produced by Middle School Students with Special Needs?

Writing, a complex, vital, life long skill (Beck & Featherston, 2003); can be very difficult for students with special needs. Newcomer and Barenbaum (1991) assert that students who have special needs, particularly those with learning disabilities often experience writing difficulties. While writing, these students struggle with legible letter formation, elusive spelling, and perplexing mechanics, which combine to inhibit the thinking processes (McCutchen, 1995). Word processing and assistive technology (AT) can liberate students from the pressure of handwriting and spelling to concentrate on higher level thinking skills. Although, as MacArthur (1996) testified, it takes more than access to technology to cultivate improved writing skills.

In 2004, Hetzroni and Shrieber studied three students attending a junior high school. These students receiving special education services under the label of learning disabilities, had age appropriate reading abilities. Because their writing skills were poorly developed, they were encouraged to use a word processor for writing tasks in an inclusive setting. He concluded that students with writing deficits could increase the quality of their written work if given access to technology.

The positive benefits of student access to technology when students had access to training and technology with special software that included such features as spell check, text to speech, grammar check, and word prediction, was described by MacArthur (2000); however, he mentioned that research on student use of AT for writing is limited. Therefore this study will expand the research base on the effects of providing AT access to students with writing deficits.

If reluctant students are given a combination of effective writing instruction and technology, will they experience writing success and increased self-confidence?

Statement of Purpose

A software program called Read and Write GOLD 9 (RWG 9), was purchased for two middle schools by a small urban east coast school district. The software contains many features that can decrease frustration and increase success for students experiencing writing difficulties. Auditory spell checker that includes definitions with the listed possibilities, auditory dictionary, homophone identifier, and text to speech capabilities are a few of the included features to enhance more independent revision of written work. Access to this software will be limited to the district's middle school students struggling with a combination of grammar, word usage, handwriting, spelling, and revision, and who have a current Individual Education Program (IEP).

The most current 8th grade statewide writing assessment percentages available show that although 82% of district's general ed students receive a passing grade and 66 % of students with disabilities pass the assessment statewide, less than 48% of this district's special education population were able to pass. District administrators would like to determine the benefits for students in this district before considering expansion of the district licenses. This study will expand the knowledge base and will be instrumental in determining the effectiveness of this assistive technology when implemented by students having difficulty with the process of writing.

Research Questions

To expand research on the use of AT for writing and to help with the district's decision to expand or reduce the use of RWG 9, the following research questions are proposed:

1. Can using assistive technology affect an increase of correct word sequences (CSW) between pre-test and post test writing samples for five seventh grade students with writing deficits?
2. Can using assistive technology affect an increase of writing rubric scores between pre-test and post test writing samples for those five seventh grade students with writing deficits?
3. Can using AT affect an increase of spelling accuracy between pre-test and post test writing samples?

Method

Participants and Background

Participants for this study will come from two middle schools in a small historic city within a large metropolitan area. Each middle school has an enrollment of around 1,000 students with a combined, demographics of approximately 46% - African American, 26% -Hispanic, 6% - Asian Pacific, and 22% - Caucasian. Of these students, 5% receive Special Education services.

Four teachers were chosen for the study but due to many difficulties, only five seventh grade students completed all the necessary components to be included in the study. One student was an African American female, three were African American males and one student was Caucasian.

Recently, RWG 9, an Assistive Technology software program, was added to the middle school computer image, providing features such as read aloud, auditory spell check with definitions, and word prediction. In order for the district to gauge the

Design

This study was designed to be a quasi-experimental, pre-test and post-test design. Each teacher chosen had two or more self contained special education classes. All classes used

technology for part of the writing process. One class for each teacher was the treatment condition with RWG 9; other classes were the comparison condition with another software program. Due to difficulties getting started with the study before the end of the year testing and due to a decrease in the availability of computers during the study, the study was not executed as planned.

Data Sources

Before training each class was given a writing prompt as a pre-test. The first rough draft was typed for assessment. After training, students had limited access to computers with the software but were able to use the software from four to six sessions in a five week period. A prompt was scheduled in the third week, but had to be abandoned due to a lack of computer availability for two of those weeks. A second writing prompt was given in the fifth week of the study.

Materials

Writing prompts were collected from a variety of sources including released statewide testing prompts and distributed to the teachers. RWG 9 training materials are provided with the software. Students each had a writing folder to contain their notes and drafts.

Procedures

First, applications were submitted to the school system and to the University's Human Subjects Review Board (HSRB) for permission to proceed. Several assemblies were held to explain the study to administrators, teachers, parents, and students. Signed parent informed consent and student assent forms were collected from all student participants. Teachers were also required to sign consent forms. Although students without signed informed consent and or assent forms accepting the specified conditions under the rules and regulations of the Human Subjects

Review Board (HSRB) participated in the activities as members of the class, only data from those with completed forms were included in the study.

The treatment class from each teacher received one hour of training on the RWG 9 software and had access to the software for three out of the next five weeks. They used a computer with RWG 9 and Microsoft Word to work on the writing process for two times a week. A writing rubric, which included components spelling accuracy, use of end punctuation, sentences that were judged to be on topic, introductory, detailed, or conclusion were given points. The number of words used was also calculated.

Data Analysis

The data from the five students was collected and entered into an Excel data sheet. The pre-test, post-test, and gain scores were gathered for correct word sequences, per-cent of correct word sequences, percent of spelling accuracy, the number of words typed, and the total rubric scores. The data was analyzed visually.

Results

The most notable gains from pretest to posttest were the increases in the percentages of increased production as shown by the percent of increase in number of words. Four out of five students increased the number of words typed by over 56%. The percent of gain on the rubric score was also large. Four out of five increased this score by over 44% and the fifth student increased his score by over 26%. All students increased the number of correct word sequences, though some of the numbers were smaller.

It was surprising that although the number of correct word sequences was greater for all students, the percent of correct word sequences increased for only three out of five students. The percentage of spelling accuracy increased in only three out of five students.

Discussion

Although the difficulties plagued this study, and very few students agreed to participate, some interesting results were noticed. The biggest increase for all students was the number of words typed. Four out of five students wrote over 56% more than they had written in their pretest. For students who normally write very little, this was a tremendous increase. The prompt may have contributed to the increase but it was still an impressive gain.

The total gain score was another increase for all students. This took into account numbers of words, accuracy, parts of a paragraph, end punctuation, and words on topic. The percentage increase for this gain was more than 26 % for all students and more than 44% for four out of five students. All students also had a positive gain score for the correct word sequences gain, though the numbers were not as great.

Contrary to anticipated findings, spelling accuracy and percent of correct word sequences were not always a natural benefit. Four out of five of the students typed the first essay using a computer with spell check as they had been doing all year. In one case, one of the boys wrote a very short, simple but correct four sentence paragraph of 33 words. For his post test writing, he was excited about the topic and wrote 99 words on topic but, as he responded later, he wanted to write quickly to get his thoughts down rather than forget what he wanted to say while looking for the correct word in word prediction or spell check. Although this student increased production by 66 %, his accuracy decreased by 46%. Three out of five students did improve accuracy in writing a small percentage.

It was noted that the student with the highest gains in all areas, produced a paper that sounded more like a story he had read or found on the Internet. The writing style and accuracy was very different from his pretest writing and far more advanced than expected.

Limitations

Limitations on this study were numerous. Although it was planned to have approximately 30 students in the treatment group and over 50 in the control group, only five students submitted all the necessary paperwork. It would have been more informative to have been able to compare the results of both groups.

The study was planned for the beginning of the year to take advantage of new routines and consistent computer time, however, due to unforeseen circumstances the study happened at the end of the year when students were less inclined to want to write and try new software. Although the study was planned for six weeks and it was hoped that students would have a minimum of three times per week to use the software, new situations in the schools made it difficult to give the students that exposure and practice with the software. The computer labs were also unavailable for three out of six weeks during the study.

It was also noted that some students preferred to avoid tools that were unavailable to their peers. At times students preferred to write quickly and not worry about spelling or writing accuracy.

Implications

The findings in several areas are promising. Even the limited exposure to the software showed some increases for all students. If students had more opportunity to use the software consistently, it could make a positive difference in writing productivity and writing accuracy. It would be interesting to compare larger groups of students using standard word processing software with other groups using more comprehensive assistive tools.

It would be important to include measures for treatment fidelity and inter-observer agreement for the writing scores in future studies. A survey given to the parents, students, and teachers would reveal much about the social validity of having AT available for students with special needs.

Technology is mandated by law to be available to help students with special needs who require it to access the curriculum, yet the technology often sits in the back of the classroom, being used sporadically for special projects and more often used only as a reward for break times and is unrelated to the classroom learning. More research is needed to find out effective ways to integrate AT in classroom to be used as tools to help students read, write, problem solve, and create.

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