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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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EDRS 842: Applications of Research Methodology in Special Education

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Abstract

Writing, a complex, vital, life long skill (Beck & Featherston, 2003), can be very difficult for students with special needs (Newcomer & Barenbaum, 1991). Students using assistive technology (AT) can overcome difficulties of spelling and mechanics to concentrate on higher level thinking skills. You could have started your abstract here. This 6 week study focuses on the effect of AT on writing products of students in 11 self-contained special education classes of 4 middle school teachers in an East coast metropolitan area. Students in 7 comparison classes used a web application for feedback after writing, while 4 treatment classes used AT during the writing process as well. Error rates and gain scores will be compared from 3 writing samples using a district rubric and a holistic score.

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Previous Research

The skill of writing, which is needed throughout life, is very complex (Beck & Featherston, 2003). 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 were? receiving Special Education Services caps not needed here 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. Is there a difference in the decrease of error rates between the first writing sample and subsequent samples of the treatment and comparison groups?

2.   Is there a difference in the Criterion holistic gain score between pretest writing sample and subsequent samples? How do the gain scores of students who use RWG 9 with Criterion compare with those who use Criterion only?

3.   Will the pretest scores, use of features, and the number of hours per week used; predict an increase in the post writing scores?

<div align="center">Method</div>

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. It is expected that the demographics of the students involved will be similar. Four teachers will be chosen for the study. Specific, detailed demographics will be available after the study.

For the past few years, Criterion, a web based service has been used during language arts. It provides immediate and specific feedback on writing products. At minimum, students use this software application two to four times a year for several sessions each. 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.

Design

This study will be a quasi-experimental, pre-test and post-test design. Each teacher chosen will have two or more self contained special education classes. All classes will use technology. One class for each teacher will be the treatment condition with RWG 9; other classes

will be the comparison condition with Criterion. Student products will be compared both within and between subjects.

Data Sources

For each student, fifth grade statewide writing assessment scores will be gathered. Before training each student will be given a writing prompt as a pre-test. The first rough draft will be typed into Criterion. After three weeks second writing prompt will be given and at the end of six weeks a third prompt will be administered. Criterion holistic score will be given for each first rough draft of the writing prompt. Each will also be assessed using the district's Descriptive Writing Rubric. Spelling logs and feature use logs from the software will be used.

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 have a writing folder to contain their notes and drafts.

Procedures

First, applications will be submitted to the school system and to the University's Human Subjects Review Board (HSRB) for permission to proceed. Several assemblies will be 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) will participate fully in the activities as members of the class, only data from those with completed forms will be included in the study.

To control for teacher influence, each teacher will conduct one or two classes in the comparison condition and one class in the experimental condition. How will these be selected? The treatment class from each teacher will receive one hour of training on the RWG 9 software and have access to the software for 6 weeks. They will use a computer with RWG 9 and Microsoft Word to work on the writing process for two to three times a week. Writing samples will be put into Criterion for analysis and student will see the feedback. The other classes will type directly into Criterion and receive feedback. Three first draft writing samples from all students written in the first, fourth, and sixth weeks will be assessed by the Criterion program. The district's Descriptive Writing Rubric, which has scores for composing, written expression, and mechanics, will also be used and the percentage of spelling accuracy and number of words used will be calculated.

Data Analysis

The fifth grade writing scores will be used to compare the classes before the intervention. Descriptive statistics will be run to identify unusual difference in the mean scores for the control group as compared with the treatment groups. Cooks distance from the Residual Statistics table reference?, will be used indicate any outliers for closer scrutiny. For the first research question, a two way ANOVA will be run to determine if there is a significant main effect for features used, or a statistically significant interaction between disability and features used. A post hoc Tukey test will be run to determine if there is a statistically significant difference between the control group and the group using one feature or more than one feature of RWG 9. I thought there were only 2 conditions; post hoc tests or for 3 or more.

To begin working with research question two, the test for equal slopes of the interaction between type of disability and features will be used. A one way ANOVA will be used to compare gain scores of the treatment and control groups.

Anticipated results

It is anticipated that the students in the treatment group will have a decreased error rate when compared to the students in the control group and that students who used the software consistently and those who used more features will have a greater gain than those who did not.

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