The Impact of Writing Output Tools on Composition Length and Writing Quality:

A Comparison of Handwriting, Word Processing, and Dictation Writing Outputs for Fifth Grade Students

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Introduction

From Smartboards to iPads, the use of technology in the field of education constantly introduces new and exciting changes to the way teachers instruct students. However, the traditional writing output method of handwriting continues to prevail despite many technological advancements in the classroom. Considering that the vast majority of current communication occurs through email and texting, it is surprising that handwriting continues to be the most used method for composition in the classroom.

For students with learning disabilities, writing is one of the most complex and difficult skills to master (Graham & Harris, 2009). Morris et al. (2009) estimate around 80% of students with learning disabilities in reading encounter difficulties with written expression. Many effective writing programs have been designed to improving general writing ability, but a program with advanced technology to aid students with learning disabilities does not exist. Therefore, the current study will explore the possible benefits of using technology as a writing output method.

Statement of the Problem

The effects of different writing output methods to assist students with learning disabilities in writing seem to be consistently overlooked. Limited research exists that explores the possible benefits of implementing word processing or dictation when writing, and most significant research has not occurred in the last ten years (Batorowic, Missiuna, & Pollock 2012). Because of this lack of research, the aim of this study is to compare different writing methods in hopes to
contribute to the research exploring the impact of writing output methods on writing length and quality for students with learning disabilities.

The writing output methods explored in this research will include handwriting, word-processing, and dictation. The goal will be to compare the quality of students’ writing samples when implementing each different method. The study will show the impact of relieving the working memory of elements such as the physical task of handwriting and focus on proper spelling by examining the quality and length of the students’ writing samples. Currently, the research prediction is that as the physical elements of writing are limited or removed, students will produce longer and better-quality writing samples. Also, the study will document how the students’ attitudes toward writing are affected as a function of using each different output method. Although an intervention will not be conducted in this research, the purpose is to gather valuable information that will aid in developing technologically advanced writing programs to assist students with learning disabilities.

**Literature Review**

In most schools today, educators place a tremendous emphasis on special education and properly serving students with special needs. Early screening processes such as the Response to Intervention model aid student learning and progress, but most of these programs primarily focus on improving student reading and mathematics skills in the classroom (Venn, 2014). In addition, experts such as Harris et al. (2007) have provided exceptional, research-based writing programs such as the SRSD method that greatly aid students with learning disabilities. However, high-quality research into the possible benefits of implementing technology-based writing output methods for students with learning disabilities is severely lacking (Batorowic, Missiuna, & Pollock 2012).
The process of writing can be particularly challenging for students with learning disabilities (Graham & Harris, 2009). Written expression proves to be a complicated process requiring the mastery and integration of multiple skills including motor functions, cognitive ability, and knowledge of proper linguistics (Batorowic, Missiuna, & Pollock 2012). Because of this challenge, the writing of students with learning disabilities is frequently shorter and often lacks proper organization in comparison to typically developing students. Typically, poor writers produce work that lacks important elements, shows minimal coherence, and exhibits many spelling and grammatical errors (Graham & Harris, 2009).

According to a review conducted by Batorowic, Missiuna, and Pollock (2012), the overall research that has been conducted on word processing shows positive effects for students with learning disabilities. However, some researchers have produced conflicting results in this area. Some studies have shown no difference in students’ hand-written or typed composition (MacArthur & Graham, 1987; Morton, Lindsay, & Roche, 1989). In retrospect, the study completed by Hertzoni and Shrieber (2004) showed that students’ word processed compositions contained fewer spelling errors and improved organization in handwritten samples, but found no difference in the overall length of the compositions. Other studies have shown that students produce longer works when using word processing (Morton et al. 1989).

Not unlike word processing, research on the effects of dictation and speech-recognition software on writing is limited (Batorowic, Missiuna, & Pollock, 2012). In 2004, MacArthur and Cavalier conducted a study for students with learning disabilities that compared handwriting, speech-recognition software, and dictation to a scribe. Even though the research focused mainly on testing accommodations, the students produced far fewer errors with dictation compared to
the corresponding handwriting samples. Graham (1999) also conducted a study that resulted in higher quality and lengthier essays when using dictation.

Method

Participants and Setting

This research study will take place at a suburban intermediate school and will consist of approximately 10 to 15 fifth-graders with mild to moderate learning disabilities who struggle with writing. Teacher permission and parental consent will be obtained prior to the study.

General Procedures

Three different writing prompts will be created that require a similar genre of response composition such as narrative writing. In each of these prompts, students will receive appropriate background information to begin forming their response. Each student participating in the study will formulate a writing response to all three of these prompts. However, each prompt will require the students to implement a different writing output method for each sample, thus providing a handwriting sample, a word processing sample, and a dictation sample. These prompts will be given at least one week apart to ensure accurate results.

Procedure 1

For the first prompt, students will be asked to provide a writing sample using the output method of handwriting. Two sharpened number 2 pencils and lined paper will be provided for each student. The prompt containing appropriate background information to begin writing will be given to each student. Ten minutes will be allotted for students to plan their writing following whatever procedure they see fit. At the end of the planning session, students will use the number
2 pencil and lined paper to write their composition. As the purpose of this study is to look at the quality and length of the compositions, no time limited will be enforced on the student. Compositions will be collected once completed, and students will then answer a short survey concerning how they felt about the composition.

**Procedure 2**

For the second prompt, students will be asked to produce a composition using a word processor. Time will be booked in the school’s computer lab for the completion of this composition. Students will only have access to the word processing program on the computer, such as MS Word, while writing. The students will once again be given a prompt with enough background information to begin writing their prompt. Ten minutes will be allotted for student planning. Students may use the word processor for planning purposes, but pencils and lined paper will also be available if requested. At the end of the planning session, students will use a standard keyboard to type the composition on the word processor. As the purpose of this study is to look at the quality and length of the compositions, no time limited will be enforced on the student. Any tools included with the word processing software such as spell check or the thesaurus will be permitted, but students must choose to use this tool on their own. Compositions will be collected once completed, and students will then answer a short survey concerning how they felt about the composition.

**Procedure 3**

For the third and final prompt, each student will be asked to dictate a composition to a scribe or specialized computer program depending on the availability of the software. Time will either be booked in the school’s computer lab for the completion of this composition or students
will separately complete their composition to a scribe in a quiet room free of distractions. If students are able to use dictation software for this prompt, each student will be taught how to use the software before completing the composition. Outside of planning, students will not have access to pencils or paper. The students will once again be given a prompt with sufficient background information. Ten minutes will again be allotted for student planning. As the purpose of this study is to look at the quality and length of the compositions, no time limit will be enforced on the student. Compositions will be collected once completed, and students will then answer a short survey concerning how they felt about the composition.

**Data Collection and Design**

**Composition scoring.** After all students have completed each prompt, the researcher will read and score each composition using a rubric. The same rubric will be used for each of the three writing output methods utilized by the students. The rubric will cover areas such as total number of words written, number of diverse in the composition, number of different sentence types, and words spelled correctly where applicable. The information gathered from the rubric will then be plotted onto a graph for easy comparison.

**Student-interest survey.** For the purpose of gathering information concerning the effectiveness of using diverse writing output methods, a qualitative survey will also be given to every student. An identical survey will be given at the end of each composition to limit any bias. Questions on the survey will both include rating scales and open-ended question. The questionnaire will be used to determine each student’s attitude towards writing when using the different output methods of handwriting, word processing, and dictation.
References


