

APPLICATION TO PERFORM RESEARCH

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Project Title: The Impact of Using Assistive Technology on Writing Productivity of Young Writers with Autism

Description:

The purpose of this research is to determine the impact of picture-to-text software and/or word prediction software on the writing performance of young student who have experienced difficulty with expressing thoughts in writing.

The research questions are:

1. When using word processing software that pairs a picture with typed words, will a student age 5 to 12 with writing difficulties independently type more sentences that express logical thoughts than if they use traditional paper and pencil to write?
2. Will having access to picture-to-text software and/or word prediction software on a word processor help a student with writing difficulties expand the number of words and correct letter sequences or correct word sequences on a topic in a five-minute writing sample?
3. Will a young student with a history of engaging in delaying behaviors begin a writing assignment more quickly when given access to picture-to-text software and/or word prediction software and a picture prompt for a writing task than if given a picture prompt, paper, and pencil?

III. Participant Involvement:

<u>Number of Subjects Needed</u>	<u>Time Requirements</u>
Part I	
Pupils: 4-12	30-45 min. 4-5 times each week
	Two 15-20 min student surveys
Parents:	Two 15-20 min parent surveys
The characteristics of the intended sample:	4 to 12 students ages 5 to 12 with difficulties expressing thoughts in writing. The targeted population of students will be healthy, Caucasian, African American, Asian, and/or Hispanic male and female children, living in the suburbs of a large metropolitan area on the east coast of the United States. The student chosen may or may not have a disability such as a Specific Learning Disability and or Autism Spectrum Disorder.
Rational for choosing this sample:	The rationale for including student with those characteristics is because the intervention, using picture-to-text software and/or word prediction software, may assist them with expressing thoughts in writing.

Describe the involvement required of subjects, attach any instruments (including reliability and validity information) that will be employed, and also attach your parent permission form letter, if students or their records are to be used in your research. If staff are to be surveyed or interviewed, please include your explanatory letter to them. Describe all other data requirements.

The design of this study is an ABCDE changing conditions single subject study which consists of:

A. The baseline phase- During these 30 minute sessions, the student will be provided a calendar and asked to choose two pictures that will be used as writing prompts. The student will be asked to write four or more sentences for each picture prompt. For one picture, the student will write using paper and pencil. For the other picture, the student will type using picture-to-text software and/or word prediction software on a computer.

B. The first software phase- A training session for the first program will last an extra fifteen to twenty minutes then the writing samples will be taken. During training the student will learn how to use different features of the software program such as picture-to-text software such as; create picture buttons, select words, use the buttons to add words to

the sentences, erase words, add punctuation marks, and listen to the text. Then the student will use the software for the rest of the phase. As in the baseline phase, the student will be given two prompts and write for a total of ten minutes.

C. The second software phase- A training session for the second program will last an extra fifteen to twenty minutes then the writing samples will be taken. During training the student will learn how to use different features of the software program such as word prediction software such as; start a word; add letters; listen to the word choices; choose a word; and listen to the text. Then the student will use the software for the rest of the phase. As in the baseline phase, the student will be given two prompts and write for a total of ten minutes.

D. The third software phase- The student will have access to both software programs to use together. As in the baseline phase, the student will be given two prompts and write for a total of ten minutes.

E. The fourth phase will be with the use of a word box with 36 rectangles or buttons. The student would brainstorm with an adult. Any words generated by the student would be typed in boxes or typed on a PixWriter pallet. The typed word box will be given to the student with the paper and pencil condition. For the computer condition, a 36 button word/picture pallet would be provided.

There are 2 dependent variables. The first is the number of points earned on each written product using the same data collection sheet. Points will be given for such components as the number of words, the number of correct letter sequences, the number of correct word sequences, introduction, details, conclusion, end punctuation, and sentences written on a topic. The second dependent variable is the number of seconds the student takes to begin writing or typing. There is a place to document the time on the data collection sheet.

The independent variables are:

- a) Picture-to-text software,
- b) Word prediction software,
- c) A combination of the two programs, and
- d) word boxes or pallets that will be generated with adult help.

The methods will be as follows.

Two writing samples will be taken at the beginning of each session throughout all phases. The order of the software presented in each phase and the length of the phases will be determined from a random drawing of 120 possibilities.

Sessions will be held at summer camp or at the student's school in a quiet setting. The student would meet with the researcher for 4 to 5 sessions per week during the research for 18 to 25 sessions. Maintenance probes would be taken two weeks or more after the final session.

At the beginning of each session, for each condition, a set of writing tools will be prepared for the student to use the student will choose one of two picture prompts from a calendar and then will be given a two minutes to independently generate thoughts. A timer will be set for four minutes of actual writing time, the student will begin to write or type about the

picture in one or more complete sentences. At the end of four minutes a notation will be made on the word the student is writing or typing. He or she will be allowed to finish his or her thoughts about the picture.

For each writing sample the adult would show the student a picture prompt and say, "Look at this picture. Think about it I will put the timer on so you can think for 2 minutes. Here is a scratch sheet of paper if you want to write or draw any notes while you are thinking. You will then be given the writing paper/computer for the actual writing. Please write/type four or more sentences to tell what is in the picture or tell about what could be happening. You will have five minutes, but if you would like more time, you may write until you let me know that you are finished."

At least two weeks after the final session, maintenance probes will be taken and assessed with paper/pencil and with computer with access to both picture to text and word prediction software programs.

In order to give insights on attitudes about writing and preferred tools, a short survey will be given to the student and to the parent or legally appointed guardian in both the first and the last sessions.

Materials

In both conditions, a stopwatch will be used to measure how long it takes the student to begin writing after being given the directions and a timer will be used to measure four minutes for the actual writing. For the paper and pencil condition the student will be given a choice of two different types of lined paper, two different types of unlined paper, and several pencils and pens. For the picture-to-text condition the student will have a word processor and picture-to-text software opened to a blank document. For the word prediction condition the student will have access to the word prediction software and a word processing program. For the word box and word pallet condition the picture writing prompt will be paired with a word box or pallet with up to 36 words that the student generated and adult typed.

We will video tape the sessions. There is a section in both forms that will request specific assent and consent to be video taped. Both the parent and child must mark the box on the forms must agree to the video taping. If permission is granted, there will be digital video recordings of the training sessions and the writing instructions for the picture prompts. While it is understood that no computer transmission can be perfectly secure, reasonable efforts will be made to protect the confidentiality of the digital recordings. The digital files will be kept carefully on a password secured computer. After the research is over the digital files will be deleted.

There are no direct benefits to the student as a participant other than to learn to use the software. It is hoped that use of these software programs for writing practice could positively affect his/her writing skills.

This study is likely to yield the following general knowledge: young student who have difficulties with writing can benefit from having access to assistive technology tools such as picture-to-text software and/or word prediction software.

Proposed Ending Date of Research: August 31st.

Frequency of contact: 3-4 sessions per week for 16-25 sessions

V. Briefly Describe Your Data Analysis Plan:

Writing samples will be analyzed by assessing Numbers of words written/typed, Correct Letter Sequences, Correct Word Sequences, numbers of sentences, parts of a paragraph, and spelling. Graphs will be created and will be analyzed visually. Randomization tests will also be used on the data to compare with the visual analysis.

VI. Results:

What is the anticipated value of the research? In general? It is hoped that the this research will help us understand the possible repercussions of the access of assistive technology in general. More specifically it will investigate the benefits of using picture-to-text software and word prediction software with students with Autism Spectrum Disorder.

VII. References: Please list references we may contact.

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Thank you for your help with this research.

Susan H. Kenney

Signature of Applicant _____ Date _____