Text-to-Speech Software: High School Reading Intervention for Students with Reading Difficulties

Closing the Gap, 2012

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Background of the Study

- Students with disabilities (SWD) are often poor readers (NCES, 2008)
- In Hawaii, more high school students perform “well-below” proficiency levels for reading than middle school students (HI DOE, 2012)
- Lack of reading instruction/remediation in high school (Engstrom, 2005)
The reading difficulties of SWD lead to…

- Low academic performance,
- Low school attendance,
- High suspension and dropout rates,
- Decreased chances of employment.

(Blackorby & Wagner, 1996; Coleman, 1996; Stoddard, 1998; Torgesen, 1998; Yelin & Katz, 1994)

There’s limited research on the ongoing use of AT and the sustained impact on reading “skills” of individuals with reading difficulties.
Purpose of the Study

To examine the use of Text-To-Speech (TTS) software as an effective tool for high school students with a reading Grade Level Equivalency from 1.0 to 6.9. for:

(1) Improving unaided reading comprehension;

(2) Increasing unaided vocabulary; and,

(3) Enhancing students’ reading fluency.
Double deficit hypothesis implies the potential of assistive technology (AT) in reading.

Reading encompasses multiple skills.

Vocabulary increases with multiple exposure to each word.
Text-to-Speech Software

Kurzweil 3000

- Synchronized visual and auditory presentation of text.
- Study skill tools (e.g., highlighting, note taking, definition search).
- Flexibility in presentation (e.g., speed, voice pitch, quality of speech, pause in reading text, colors).
Quasi-Experimental Design

- Comparing pre and post data of intervention and control groups.
- 126 9th graders at 9 high schools (94 in the intervention group & 32 in the control group), reading below 6.9 GLE.
- **Intervention** for 1 semester (90 days).
- Trained the subjects to master the TTS to 95% proficiency.
- Guided to use it for reading in class for at least 40 min/week.
- **Data sources**: Nelson-Denny Reading Test, time spent using the TTS documented by the server, and class grades
Research Hypotheses

- High school students in grade 9 who are reading between a 1.0 and 6.9 GLE, who use text-to-speech software for a period of one semester, in comparison to a control group, will have statistically significant increases in:

1. unaided reading comprehension;

2. unaided vocabulary;

3. unaided reading fluency; and

4. class grades.
Participants in the intervention group had a significant increase in reading comprehension, compared to participants in the control group, over time, as measured through general linear model (GLM)-repeated measures.
There was no significant difference in vocabulary between participants in the intervention and comparison groups, over time, as measured through GLM-repeated measures.
Participants in the intervention group had a significant increase in reading fluency compared to participants in the comparison group, over time, as measured through GLM-repeated measures.
There was no significant difference in class grades between participants in the intervention and control groups, as measured through GLM-univariates.
Limitations

- Method of recruitment (e.g., Did not recruit all students in the schools reading between the 1.0 and 6.9 GLE; Did not make participation of these students mandatory).

- Variation in teachers’ integration of TTS in their classes.
Recommendations

- More control over teachers’ use of the software.
- More control over the content the subjects use during the intervention period.
- More control over the features of the software used (e.g., definitions and note taking).
- Additional research on the reading development theory of high school struggling readers (why improving reading comprehension and fluency, not vocabulary?).
DISCUSSION

QUESTIONS & ANSWERS
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