About the Project, Steppingstones: Text-to-Speech Study Phase 2

Steppingstones of Technology Innovation for Children with Disabilities is funded by the U.S. Department of Education’s Steppingstones of Technology Innovation Grant Program. The goal of the project is to measure the effectiveness of text-to-speech software as a reading intervention for improving overall reading skills, academic performance, and academic aspirations of high school students with reading difficulties.

The project stems from a technology-based approach developed under a Steppingstones Phase 1 Development Study. In the Phase 1 Study researchers implemented text-to-speech (TTS) software and determined its feasibility of use in 2 high schools on O’ahu. Findings indicated a significant improvement for unaided reading comprehension and vocabulary after the students used the TTS software for one semester.

Steppingstones: Text-to-Speech Study Phase 2 is being implemented at 12 public high schools on O’ahu over the past four school semesters. Each semester, each participating teacher is randomly assigned to the intervention or control group. Targeted subjects are 9th graders who are (1) students with disabilities (SWD), (2) students that are at risk for referral to special education services, and (3) students whose reading scores are between 1.0 to 6.0 grade-level equivalencies. Subjects in the intervention group use TTS in class for a minimum of 40 minutes per week for 1 semester. Students in the control group receive business-as-usual. Outcomes data are collected at the beginning and end of each semester using the Gates MacGinitie Reading Test, school records, and student surveys. A multilevel analysis is conducted to evaluate effectiveness of the TTS software intervention.

Participating High Schools in TTS Project

Almost all of the public high schools on O’ahu are participating in the Stepping Stones: Text-to-Speech Study Phase 2. As of Fall 2011, 17 teachers and 94 students from 9 public high schools have gone through the TTS training and have been utilizing TTS software for instructions or for classroom reading purposes. This Fall 2012, 3 more schools came on board increasing our number of servicing schools to 12. Following are the names of the participating high schools:

Nanakuli High School  Kaimuki High School  Aiea High School
Roosovelt High School  McKinney High School  Kalani High School
Farrington High School  Pearl City High School  Castle High School
Campbell High School  Kapolei High School  Kailua High School
Farrington High School Integrates Text-to-Speech Project into ELL Classes

Ms. Akiko Giambelluca interacted with her 9th Grade ELL students, at Farrington High School, who are using Text-to-Speech for reading.

Some English Language Learning (ELL) classes at Farrington High School, under Ms. Akiko Giambelluca’s direction, have successfully been integrating Text-to-Speech software into their normal reading activities. Students use the software to delve deeply into engaging reading texts, such as National Geographic for Kids and other sophisticated reading materials. The software, through its read aloud and dictionary features, allows the students the ability to interact with reading that might have otherwise been too difficult. Ms. Giambelluca encourages students to actively summarize main ideas, learn new vocabulary words, and ask probing questions while reading. Students become active readers when they utilize the study skills tools to read school textbooks. The learning experience is especially meaningful for some of the students who have recently arrived to the island with very limited English proficiency and might not even have touched a computer before to begin to make linguistic steps to transition to the new cultural environment of Hawai‘i.

The Benefits of Text-to-Speech Project

Following are the results from Spring 2011 and Summer 2011, showing increases in both Reading Comprehension and Vocabulary Skills:

**Reading Comprehension:**
- A statistically significant increase in reading comprehension Grade Level Equivalency (GLE) over time was found.
- The mean reading comprehension GLE increased from 4.6 in the pre-test to 5.3 in the post-test.

**Vocabulary Skills:**
- A statistically significant change in the vocabulary over time was not found.
- However, mean scores did tend to increase; the pre-mean vocabulary GLE was 5.2, and the post-mean vocabulary GLE was 5.4.

What people say about the project, Stepping-stones: Text-to-Speech Phase 2

“When they use the computer, they’re really focused on the reading... All of the students seem to really like the program.”

“Using this program, I think all of the students became interested in reading.”

“I'm using the program to supplement our reading activities. I have so many reasons why I like this program. First, I can use any reading materials that I like. Then also the student can read at their own level, too.”

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