Computer-based tutor performs like an experienced teacher in detecting reading errors

Implementation Objectives

The Reading Assistant product uses speech-recognition technology to provide students with computer-based, one-on-one tutoring for guided oral reading practice. The Reading Assistant identifies reading errors, while ignoring background noise and speech variables irrelevant to reading, such as accent. This briefing summarizes a study examining how closely the Reading Assistant product matches a human teacher in terms of diagnostic specificity (i.e., the ability to distinguish correctly read words from reading errors) (Adams, 2006).

Methodology

Recordings were made of 349 passages read aloud by 153 students from the Boston Metropolitan area. Two experienced reading teachers listened to the recordings and marked each passage, identifying whether a word was read acceptably or whether a reading error was made. For the error words, two levels of difficulty were identified: words requiring immediate intervention and words for later review. The teachers were instructed to reach agreement on their judgments, and were allowed to rewind the recordings and listen as many times as needed. The Reading Assistant software also marked each passage, using the same diagnostic categories.

Results

The two teachers reached a high level of inter-rater agreement, assigning approximately 98% of the words to the same diagnostic category. The Reading Assistant also had a high level of agreement, assigning approximately 95% of the words to the same diagnostic category selected by the teachers.

Group	Percent False Positives	Percent False Negatives	Number of words in text
2nd Grade	2.19	2.30	1040
3rd Grade	2.60	1.96	5078
4th Grade	1.50	2.03	1040
5th Grade	1.60	0.89	624
6th Grade (all)	1.60	1.39	11177
6th Grade (ELL only)	1.66	1.10	2289

As shown in the table above, the Reading Assistant product had a similarly high level of agreement across all five grades studied. The words on which the teachers and the Reading Assistant disagreed were evenly distributed across false positives and false negatives. (This analysis used the teachers' judgments as the standard. False positives occurred when the Reading Assistant identified an error word as correct. False negatives occurred when the Reading Assistant identified a correctly read word as an error.)

Discussion

The results reported here demonstrate that the diagnostic sensitivity of the Reading Assistant product is similar to that of some experienced reading teachers. This shows that the Reading Assistant can successfully approximate a human tutor in the level of oral reading support and corrective feedback it provides.

Of the sixth graders participating in this study, 38% were designated as English Language Learners (ELL). When their results were analyzed separately, a similar pattern of results emerged. This indicates that the Reading Assistant also has a high level of diagnostic sensitivity for students speaking English as a second language.

Program Study Statistics

Number of Participants:
153 students
2 teachers

Grade Level:
Second through sixth grade

Products Used:
Reading Assistant

References:
Adams, M. J. (2006). The promise of automatic speech recognition for fostering literacy growth in children and adults. In M.C. McKenna, L.D. Labbo, R. D. Kieffer, & D. Reinking (Eds.), *International Handbook of Literacy and Technology, Volume 2.* Mahwah, NJ: Lawrence Erlbaum Associates.

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