How Marni Helps English Language Learners Acquire Oral Reading Fluency


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Abstract

We will demonstrate Interactive Books that children English can use independently to learn to read English texts accurately, fluently and expressively. The books feature Marni, a bilingual virtual reading teacher. Marni first familiarizes children with text by narrating it in the child’s first language, (currently, either Chinese or Spanish), followed by narration and read along activities in English. Following the familiarization activities, students attempt to read the text by themselves, but are able to click on words to hear Marni say them. The system then provides the child with feedback on their overall fluency score in terms of accuracy, reading rate and how expressively they read the text, and highlights all words in the text scored as errors—words that were clicked on, skipped over, or misread during independent reading. The student then practices listening to and watching Marni pronounce words classified as reading errors, and can elect to record and listen to their own production of the word and compare it to Marni’s. The child then listens to Marni produce the complete sentence, records themselves saying the sentence, and compare their production to the model produced by Marni. This process—-independent reading, feedback on oral reading fluency performance, and practice listening to, reading and saying words and sentences, proceeds through two to three repeated readings.

1. Introduction

The need for accessible, affordable and highly effective tools to improve young learner’s reading achievement in the U.S. is highlighted by the results of the 2009 National Assessment of Educational Progress report (NAEP) [1]. In grades 4 and 8, about one-third of all students performed at or above the proficient level, indicating that approximately two thirds of fourth and eighth grade students are not proficient readers. Students with low English language proficiency, the fastest growing population of students in the U.S., test about 50% lower than their peers with higher English language proficiency. While many students can be helped by individualized instruction, there are insufficient resources to provide tutoring to all students who are at risk of negative academic outcomes because of their lack of reading skills. There is thus a clear and urgent need to provide students with tools that they can use independently to learn to read English texts fluently and with good comprehension.

1.1 The Importance of Oral Reading Fluency (ORF)

A synthesis of scientifically-based reading research by the National Reading Panel in 2000 [2] concluded that “Reading fluency is one of several critical factors necessary for reading comprehension, but it is often neglected in the classroom. If children read out loud with speed, accuracy and proper expression, they are more likely to comprehend and remember the material than if they read with difficulty and in an inefficient way.” The relation between ORF and reading comprehension has been well established by previous research, particularly for students in elementary school [3,4,5].

2. Interactive Books

Interactive Books (IBs) are designed to immerse students in a multimedia learning environment in which they converse with the virtual tutor, Marni, who helps them learn to read English texts accurately, fluently and expressively. Marni is a lifelike computer character designed to model the behaviors of a sensitive and effective reading teacher. In interactive books, Marni’s personality is communicated by the voice of the human teacher that records the prompts. Marni produces accurate visual speech, natural head movements and facial expressions synchronized with the recorded utterances of a sensitive and effective bilingual reading teacher. Marni currently speaks English, Chinese, and Spanish.

Oral reading fluency in taught in Interactive Books using a proven approach called Repeated Reading, in which students read a text passage books several times, with feedback, practice and support between readings [6]. Our Interactive Books provide first language support (in Chinese and Spanish) to English language learners in several ways: by enabling students to listen to in their first language (after listening to them in English), by having Marni narrate text passages in their first language, by reading along with Marni in their first language, and by enabling students to look at, listen to and compare printed and spoken words in both English sentences in a text and a Spanish translation of the English sentence.

2.1 Familiarization Activities

Familiarization activities are designed to help students understand the meaning of the text they will read, to learn the meanings of individual words in the text, and to associate spoken and printed words with their Spanish and English pronunciations and meanings. For example, Marni may narrate the text in Spanish (to a student who speaks Spanish and is learning English) while the student looks at the picture(s) on the page. The student can then listen to Marni narrate the text in Spanish as each word in the text is highlighted. The student can then read the along with Marni (choral reading) in Spanish, with slight pauses between words, so the student can read along at a comfortable pace. These same activities can then be practiced in English, with repeated in English. These activities are designed to exercise listening comprehension skills, to help students make connections between Spanish and English words, and to become familiar and learn to
pronounce the individual words in the text. Figure 1 shows screenshots of Marni about to narrate a text in English and Spanish.

![Screenshot](image1.png)

**Figure 1.** Feedback to student following first independent reading. Student has displayed Spanish translation of the English sentence she is practicing.

### 2.2 Oral Reading activities

Oral reading activities follow the familiarization phase, are designed to help children learn to read words in texts accurately, at a natural speaking rate, and with appropriate prosody. This is accomplished through two or three repeated readings of the text, with feedback on oral reading fluency performance following each reading, and practice listening to and saying the words and sentences that were identified by the speech recognition system as needing improvement.

**First Independent Reading:** Before the student reads the text the first time, Marni provides instructions that emphasize the importance of reading the words on the page as accurately as they can, and to read naturally, rather than trying to read as fast as they can. Marni instructs the student to skip over those words they are unable to read. Marni tells the child to click on the flashing arrow when they are ready to begin reading. When the child clicks on the arrow, the words on the page appear. The child’s speech is recorded.

**Feedback:** Immediately after the student has completed reading the page, the Interactive Book provides both graphical and verbal feedback to the student on their reading performance. Students receive a score, presented both graphically and numerically, based on the number of words in the text they read correctly and their reading rate; this score is a normalized version of Words Correct per Minute (WCPM), a standardized measure of oral reading fluency. In addition, the system presents a score, both graphically and numerically, that represents how expressively the student read the text. Each of these measures is important, since accuracy, rate and expressiveness are three interrelated components of oral reading fluency. It is especially important that students are not reinforced for reading words accurately and fast, but without proper expression, since reading in this mode may not support comprehension. When students read expressively, emphasizing new and important information consistent with the discourse structure of the text, they are demonstrating that they are reading with understanding. We are currently investigating the most intuitive and informative ways to combine and present this information to students. Expressiveness in order to reinforce all three aspects of oral. Our previous research has demonstrated that we can estimate these three components of oral reading fluency at levels that approach or exceed human judgments (Bolanos et al., 2011; Bolanos et al., under review.)

**Practice:** After receiving feedback on their overall oral reading fluency performance, Marni asks the child to click on each highlighted word in the text in order. The student listens to Marni say the word, and then records and listens to their production so they can compare it to Marni’s. When practicing individual words in a sentence, the student can click on an icon to display a translation of the sentence in Spanish, as shown in Figure 1. The student can then click on a word in either the English or Spanish sentence, which causes the corresponding word(s) to be highlighted and spoken by Marni in each language, thus enabling students to build associations between word meanings in their first language and English. After practicing each individual word that was scored as a reading error, Marni says the complete sentence. The student is then asked to record and playback the sentence so they can compare their production to Marni’s. The student can elect to re-record the sentence if they desire.

**Second and/or third readings:** The process of having the student independently read the text, receive feedback on their performance, then practice reading, recording and playing back individual words and sentences can occur two to three times.

### 3. Acknowledgements

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### 4. References


