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Abstract

To achieve language proficiency, older English learners face the challenge of simultaneously acquiring the academic language of school while building the vocabulary base of a mature readers and language users--that is, high frequency words found in a variety of texts and known by proficient readers. One particularly useful classroom tool that supports vocabulary learning is the word wall. While traditionally associated with primary and elementary classrooms, the word wall, if implemented appropriately, may potentially aid the vocabulary development of English learners. In this study, we compared the use of digital word walls to two research-based interactive word wall formats with high school English learners. While we found no differences in word-meaning acquisition, the level of engagement was higher when students participated in the digital word wall format where they developed vocabulary vodcasts using Photostory. All three interactive word wall instructional techniques are described in this article.

As a teacher of English Language Learners (ELLs), I know that vocabulary development is critical to their academic success. Students enter my classroom from all over the world, with vastly different levels of English language abilities as well as different educational backgrounds. One thing they all have in common is the frustration they feel with their limited vocabularies. Often, ELLs have a clear understanding of a given concept but do not have the words to express this understanding in English. By providing ELLs with vocabulary strategies to create meaning from new and unfamiliar words, we are helping them to close this gap.

Liz, high school ESL teacher

Liz's message to teach vocabulary effectively to English learners is one that has been the topic of many research studies (e.g., August, Carlo, Dressler, &Snow, 2005; Fitzgerald, 1995; Jimenez, Garcia, & Pearson, 1996; Nagy, 1997) and one that resonates with many teachers of English learners. As witnesses to the challenges that a limited vocabulary places on these students on a daily basis, these teachers understand the need to provide effective instruction for building word knowledge. In this article we describe a study we recently conducted to determine the efficacy of one time-honored instructional practice, the word wall, as a worthwhile instructional tool for supporting word learning with English learners. We used three variations of word walls in the study, with all three markedly different than traditional versions. Conventional use of word walls involve the teacher simply posting previously taught words on a wall in the hope that the seeing the word will remind students of what the word means and how to use it in a sentence. The three different versions of word walls we used in the study were designed to meet the need of older learners and were highly interactive and student centered. Two of the word wall variations used standard classroom bulletin boards while the third one was a digital version of the word wall using the mobile learning device, the iPod. In a constantly changing digital information age, it is imperative that we adapt existing practices to new technologies to accommodate the new literacies of the 21st century (International Reading Association, 2009; Partnership for 21st Century Skills, 2007). With increasing emphasis on these new technologies, we were especially interested in the effects of using a digital format for the traditional word wall approach

to teaching and learning vocabulary. Therefore, our research questions were the following:

What understandings do ESL high school students have about using iPods to learn vocabulary?

Is there a difference in vocabulary achievement of ESL high school students using conventional interactive word walls versus digital word walls?

We begin by providing a rationale for vocabulary learning, in particular with English learners as well as justification for using word walls. What follows next is a description of the study and subsequent results concerning high school English learners' perceptions and use of mobile learning devices for word learning. We also share the findings that illustrate the variability and usability of interactive word walls as a vocabulary learning tool with older English learners. We then provide a description of the three instructional adaptations for using the word wall.

Importance of Vocabulary Learning and Teaching

We have known for a very long time about the importance of vocabulary in reading. Studies on vocabulary date back to the early 1900s and span subsequent decades resulting in a wealth of information to inform teaching and learning (Dale, 1931). Currently, vocabulary is one of the "hot" topics in the field of literacy and is recognized as one of the five pillars of literacy by the National Reading Panel (Cassidy, Valadez, &Garrett, 2010). As Blachowicz, Fisher, Ogle, and Watts-Taffe (2006) noted, the increased interest in vocabulary development has brought a renewed emphasis on our understanding about the complex relationship between word knowledge and comprehension, especially given the availability of new and varied digital and print text sources. With this changing face of vocabulary knowledge, it is not surprising that our nation's children continue to be victims of what has been called the vocabulary gap (Biemiller & Boote, (2006) which, according to research (e.g., Chall, Jacobs, & Baldwin, 1990; Chall & Jacobs, 2003; Hart & Risley, 1995), is largely due to a degree of privilege related to their socioeconomic status as well as their level of proficiency in learning the vocabulary of the English language.

Students who speak a language other than English do not fare as well as their English-speaking counterparts as noted in the Nation's Report Card (2007) and by the National Center for Education Statistics (2010). While there are multiple factors that contribute to this gap, low vocabulary is a major contributor, especially in light of the academic demands placed upon older learners (August, Carlo, Dressler, &Snow, 2005; Fitzgerald, 1995; Jimenez et al., 1996; Klingner, & Vaughn, 2004; Nagy, 1997)--more so than even background knowledge about a topic (Garcia, 1991). As Pilgreen (2010) candidly pointed out, "Older students have more to achieve and [have] less time to do it" (p. 2). The English learners in middle school and high school face academic demands that become exceedingly more complex and more difficult with each successive grade level and such demands even continue into college (Gonzalez, 1999; Johnson & Steele, 1996). These students are frequently confronted with school-related tasks that require high-level thinking tasks, such as problem solving activities and inquiry-based projects found across subject-matter disciplines. To successfully complete these tasks, students need to possess a solid level of language proficiency.

Yet, to achieve language proficiency, older English learners face the challenge of simultaneously acquiring the academic language of school while building the vocabulary base of a mature language user. The words used by mature language users are described by Isabel Beck and her colleagues (2002) as high frequency words found in a variety of texts and known by proficient readers. To learn such words, students need opportunities to use newly acquired word meanings beyond a definitional level--that is, beyond eliciting the meaning of a word as evidence of understanding. They need to engage in activities that emphasize the application of word meanings in speaking, writing, reading, and listening. Furthermore, students need to develop independent word learning strategies to help them make viable connections for retaining word meanings, such as strategies that involve both personal associations for retention as well as understandings of appropriate contexts for using words.

While the National Reading Panel (2000) asserted that there is no single best method for teaching vocabulary, there are important, underlying instructional components necessary for promoting word learning with English learners. Nagy (1988) argued that for vocabulary instruction to be effective for all learners, three components are necessary and include the following: (1) targeted words need to be integrated with related, known words and concepts; (2) learners must have multiple opportunities to apply the words; and (3) these applications must reflect meaningful use. Other components evident in the literature especially for English learners include using visuals, contextualizing word use, and allowing for collaborative learning (Harper & de Jong, 2004; Jacobson, Lapp, & Flood, 2007; Palmer, Shackelford, Miller, & Leclere, 2006/2007) . One particularly helpful classroom tool that can incorporate these components of effective vocabulary instruction is the word wall.

While word walls and their variations (Harmon, Hedrick, Wood, Vintinner & Willeford, 2009) have been

in use for decades, we know of only one other study that focused on digitalizing the word wall. This study by Yearta (2012) used a mixed methods design to determine the effects of a digital word wall with 43 fifth grade students studying Greek and Latin roots. While further research is needed, Yearta's findings indicated that the digital word wall is a viable vocabulary instructional method. For sure, word walls are just one of many effective strategies that can and need to be adapted to the new literacies of the 21st century (International Reading Association, 2009; Leu, 2006).

Word Walls

The word wall, while traditionally associated with primary and elementary classrooms, is also an important artifact for creating a print-rich environment in middle school and high school classrooms. When implemented appropriately, the word wall can be used effectively in helping teachers provide sound vocabulary instruction. For example, in their investigation of the use of the interactive word wall instructional framework with seventh grade students, Harmon and her colleagues (2009) found that students who were engaged in the interactive word wall instruction acquired deeper understandings of word meanings and retained this knowledge over an extended period of time. Components of the interactive word wall instruction mirrored the features of effective vocabulary instruction mentioned previously--students engaged in multiple, meaningful use activities with the words where they made personal connections to real world applications in a variety of ways involving color, visuals, and written contexts. Furthermore, in their review of the research on vocabulary development of diverse learners, Wood and her colleagues (2011) similarly noted that effective instruction included the following: (1) active engagement in word learning that offered multiple exposures and meaningful use; (2) use of explicit, scaffolded instruction about the use of context clues and word level analysis; and (3) integration of technology as a useful, motivating tool for building a stronger word knowledge base.

Interactive Word Wall Study

In our study of word walls, we closely examined the use of iPods, a mobile learning device, for promoting vocabulary learning with high school English learners. As previously mentioned we asked two questions:

What understandings do ESL high school students have about using iPods to learn vocabulary?

Is there a difference in vocabulary achievement of ESL high school students using conventional interactive word walls versus digital word walls?

Method

Twenty-two high school students in grades 10, 11, and 12 participated in the six-week study. These students were enrolled in ESL classrooms taught by the same teacher in a Title I school located in South Central Texas. To answer the first research question concerning students' understandings about using iPods to learn new words, we conducted individual interviews with the students both before and after the instructional interventions. We also examined student work developed from the word wall activities as well as the teacher's reflective journal notes. To answer the second research question about differences in vocabulary achievement between the interactive word walls using standard bulletin boards versus the digital word walls, we administered teacher-developed vocabulary tests for measuring students' knowledge of the targeted words in the lessons provided.

After administering the pre-interviews, we collected data from the three instructional interventions involving the word walls. The teacher-selected words for instruction came from the required readings of short stories and the novel *Esperanza Rising* (Munoz, 2000) that were part of the curriculum. The teacher used the three instructional models with different class sections. All three models were based upon what we know about effective vocabulary instruction—that is, the need for integrating or connecting words with other known words and ideas and the need for multiple exposures of using the words in meaningful ways (Nagy, 1988). In one model the students taught specific words to their peers while they created an interactive word wall. The students used colors, symbols, and situations to connect to the word meanings (Harmon et al., 2009). For the second model, the teacher used an adaptation of the Frayer Model (Blachowicz & Fisher, 2006) which involved having students complete vocabulary cards containing the definition, synonym, a drawing, and a sentence containing the word. The last instructional model involved the use of iPods to create digital word walls. The students again taught their assigned words to the others. In this intervention the students created vodcasts for their words. Vodcasts are podcasts that include visual images. The students used Photostory, a free application that allows users to create the vodcasts. Once the vodcasts were completed, the students downloaded their work onto the iPods to use for reviewing the word meanings. A more detailed description of each instructional intervention is provided in a subsequent section of this article.

Findings

In their responses to the first interview question about using iPods for word learning, we found that all of the students except for one in the pre-interviews believed that iPods could be beneficial for promoting word learning. While students had positive perceptions about the iPod as an important tool for learning new words, their responses remained at a general level,

such as “It will help you learn.” Students also felt that teachers could use iPods in the classroom to help them build vocabulary as well as listen to stories and even listen to themselves speak in English. Only during the post interviews did students talk about how the visual aspect of the vodcasts (podcasts containing visual images) enabled them to understand the word meanings. Furthermore, students mentioned that hearing the pronunciation on the vodcasts was important; however, several noted that sometimes the pronunciation made by another student was not clear and led to confusion. In our tally of the frequency of responses, we found that the majority of the students (over 75%) valued the use of iPods as an important tool for learning in the classroom. All students had positive comments about using the iPod for word learning. These findings suggest that iPods may serve as an important instructional tool for helping English learners with vocabulary acquisition.

In regard to our second research question regarding achievement differences across the three word wall instructional variations, our statistical analysis revealed no significant differences in meaningful use of words in which students move beyond a definitional level to application of words. Overall, each technique afforded students the opportunity to actively engage in word learning tasks that focused on associations with the meanings of the words and actual applications of the words in meaningful contexts. The students, however, were more motivated in their interactions with the iPods as they created their own digital word walls. Their level of engagement was high as they created a multimedia presentation that required surfing the Internet to find visual images of their words, recording their explanations of words, and then synthesizing the information that would help others understand the words.

Word Wall Variations

In this section, we provide a detailed description of the three instructional frameworks we used in the study. The instructional frameworks are the Interactive Word Wall, Adaptation of the Frayer Model, and the Digital Word Wall. For each instructional framework, the teacher began the lesson by conducting a shared reading of short stories and a novel that were part of the reading curriculum. She read the texts aloud as the students followed along, stopping at strategic points to ask questions, clarify important points, and draw attention to targeted vocabulary words in an informal way. After each shared reading, the students then participated in the word wall instructional activities.

Interactive Word Wall

Students engaged in a variety of word learning tasks in the Interactive Word Wall instruction. These tasks included: use of instructional contexts for determining word meanings, associative activities using color and symbols, development of situations involving appropriate word use, a focus on word variations, and students’ presentations for teaching the words to others in the class. The teacher first of all selected several words from an assigned text students would be reading. For each word, the teacher began instruction by discussing the meaning of each targeted word and its use in both a carefully written instructional context as well as in the context of the short story. For example, the teacher selected the word *anguish* from the following context found in the book *Esperanza Rising* (Munoz, 2000): “Her smile faded, her chest tightened, and a heavy blanket of *anguish* smothered her smallest joy” (30). The teacher first presented an instructional context she developed to aid students as they used obvious context clues to figure out the meaning of *anguish.* The instructional context was “Gregory slid into third base and everyone in the crowd heard the snap as his ankle twisted and broke. We all knew how much it must have hurt when we saw the look of *anguish* spread across his face.” The meaning students inferred from the instructional context for *anguish* was then applied to the use of the word in the context of the story.

After this introductory discussion for the selected words, the teacher assigned student partners to complete an in-depth study of one word for display on the Interactive Word Wall and subsequent sharing with the class. Students first completed the planning sheet shown in Figure 1. Some tasks were designed to help the students retain word meanings through associational activities, such as assigning a color to the word meaning and drawing a symbol representing the word meaning. For example, for the word *anguish*, the students selected the color black to represent suffering and pain and used a hole to symbolize the idea of being trapped and feeling like “there is no way out.”

Another task that was part of the Interactive Word Wall included thinking of a situation in which the word could be used. In this example for the word *anguish*, students thought of the *anguish* children would feel if their parents were going through a divorce. The last task was to consider variations of the word to emphasize that while different functions of the word can change the spelling of the word, the meaning still remains the same. For the word *anguish*, students wrote *anguished* and *anguishing*.

To create the Interactive Word Wall, student partners wrote their targeted word on a flash card. Next to the word on the flash card, they drew a square and filled in this space with the color they selected for their word. Next to the color, students wrote the word variations.

FIGURE 1

Word Wall Planning Sheet

Write your word.	
Define your word.	
Select a color and tell why you selected that color.	
Draw a symbol and tell why you selected that symbol.	
Draw a situation to represent the word and tell why you selected that symbol.	
Write a sentence completion using the word.	
Write forms of the word.	

Then on two index cards, the students drew the word symbol on one and the situation on the other. Both cards were then placed next to the flash card on the Interactive Word Wall. In their presentation to the class, the students made references to the word wall as they explained their thinking about the designated word. Two snapshots of the interactive word wall are in Figure 2.

Instruction using the modified version of the Frayer Model (Frayer et al., 1969) for a word wall also provided students opportunities to engage in meaningful word learning tasks. The original Frayer Model is a four-square graphic organizer designed to extend conceptual understanding by having students differentiate between important and unimportant characteristics that represent a concept as well as distinguishing between examples and nonexamples of the concept. While intended for use with informational topics, the section of the Frayer Model pertaining to examples worked well with the narrative texts used in this word wall instructional plan. While maintaining the purpose of the Frayer Model for helping students think more deeply, the teacher altered the categories to include definitions and visual representations.

After the shared reading of a short story, the teacher first displayed a list of the vocabulary words encountered in the short story. Students each selected one word to create a graphic organizer for the word wall. The graphic organizers or word cards consisted of sheets of construction paper on which the students drew four squares with a circle in the middle for the word. To gain a sense of the word's meaning, students initially revisited the text using available context clues to determine at least an approximation of the meaning.

FIGURE 2

Segments of the Interactive Word Wall

Adaptation of the Frayer Model

Once they formulated an idea of the word's meaning, students had the option to confirm their understanding by using a dictionary, asking peers, or even asking the teacher. Students then wrote their word in the center of the graphic organizer and the confirmed meaning in their own words in one of the squares. For example, for the word *squinted* one student wrote "to peer with eyes partly closed." For the word *proximity* another student wrote "nearness; close to something."

After establishing a definition, the students then used one of the squares to create a visual representation of the word. The student working on the word *squinted* drew a pair of eyes that look closed and the student who selected the word *proximity* drew a school and his house indicate that his house was close to the school. Both illustrations demonstrate that the students understood the word meanings well enough to provide such drawings.

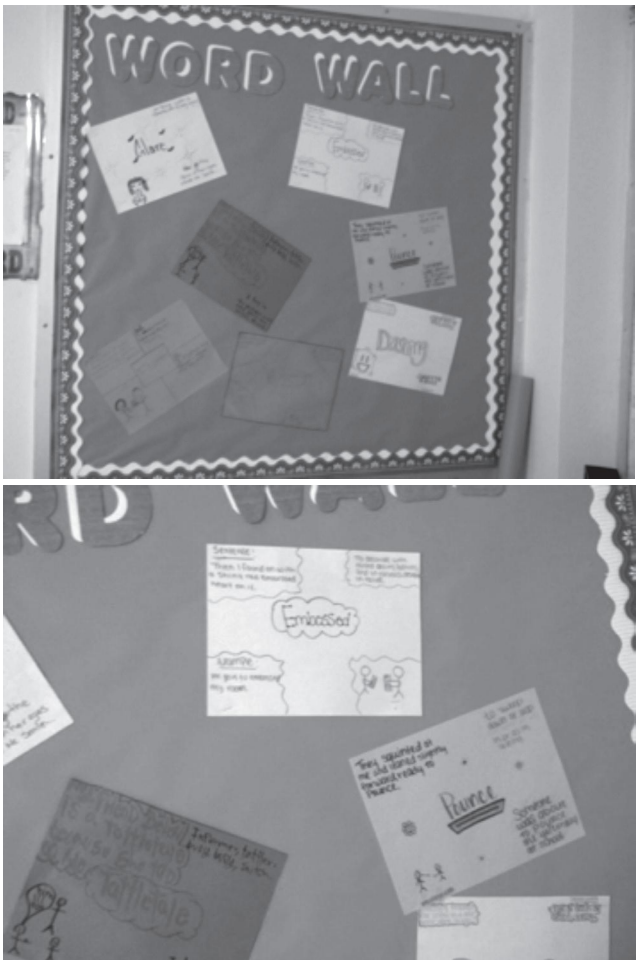
Students used the third square to include an example of a situation which applied to the word. For example, for the word *squinted*, the student wrote "I squinted my eyes when I can't see," probably referring to times perhaps when the sun is too bright or objects are too far away. For the word *proximity* the student referred to his picture of the school and his house and simply wrote "I live near the school." Another student who worked on the word *descend* used an example of a plane descending for landing.

In the fourth category, students had the choice of either providing a nonexample of the word or writing a sentence. While students had these choices, they mainly wrote sentences with the words. For example, one student wrote "When I *squinted*, I could see past the end of the block." Another wrote "He watched my fingers *greedily* push big chunks of pie down my throat." The nonexamples were discussed verbally and mainly consisted of antonyms. Once the word cards were complete, the students would then share with the rest of the class and post the cards on the word wall (See Figure 3.) The word wall served as a reference when students encountered the words in other contexts and as a classroom tool for reinforcing word meanings.

Digital Word Wall

The digital word wall was modeled after the interactive word wall. The tasks that were completed were similar to the interactive word wall. The digital word wall instruction began the same way. The teacher selected words from short stories and proceeded with instruction in the same manner. In other words, the teacher discussed the meaning using written context and context from the short story. Then the teacher divided the students into pairs to complete an in-depth word study as they did with the interactive word wall.

FIGURE 3
Word Wall Using Adaptations of the Frayer Model



The major difference in the digital word wall was the students used Microsoft Photostory to create short vodcasts for each word instead of using paper and pencil to create flash cards. For example, part of the in-depth word study included completing a planning sheet, assigning a color to the word, drawing a symbol, thinking of a situation and writing variations of the word. In the digital word wall, the students created their planning sheet in the form of a storyboard (See Figure 4). A storyboard is a document that helps the user plan each slide for the vodcast. Similar to the planning sheet for the interactive word wall, the story board used for the digital word wall helped students plan their vodcasts. The first box of the storyboard contained the word and each successive box contained the color, symbol, situation, and variations of the word.

Once the storyboard was completed, the students then used Netbook computers to find the images online that

coincide with the storyboard. Once the images were found, the students used Photostory to put their digital word wall vodcast together. Since Photostory enables users to include narrations, each slide for the vodcast contained some audio recording of the student. For example, the student who worked on the word *deliberate,* narrated the first slide containing the word by saying, *"My word is deliberate and it means to do something on purpose."* In the next slide, the students depicted a color to represent the word's meaning and also provided an explanation for selecting that particular color. The following slide contained a picture of a symbol selected to represent the word's meaning accompanied by the student's narration explaining the connection to the word. The symbol could have been a drawing made by the student or an image found online. If the student drew the symbol, a picture was taken with a digital camera and then uploaded to the vodcast. As noted in Figure 4, this student found a photograph of a light bulb to include in the vodcast. The next slide contained an image of a situation with an explanation, such as a girl *deliberately* turning off the light switch. Finally, the student narrated a sentence using the word for the last slide in the vodcast. In this example, the student's sentence of "The purpose of light is deliberate." represents her attempt to explain that we are deliberate in our actions when we turn on a light switch.

FIGURE 4
Digital Word Wall Story Board

Students shared their vodcast with all the students in the class via iPod Nanos. The teacher uploaded each vodcast to iTunes and then synced each Nano so the students would have access to all digital word wall vodcasts. Each student was provided an iPod Nano to review all of the vocabulary words for the week. Students had the option to take the iPods home to study the words or to use the iPods during class time.

Concluding Statements

Students are encountering more vocabulary words than ever before from the increasingly varied forms of text content available to them. As teachers, we can take advantage of the variety of ways in which word walls can engage students in word learning. All three word wall approaches described here (i.e., interactive word wall, adaptation of the Frayer model, and digital word wall) reflect the four goals of effective vocabulary instruction espoused by Fisher, Blachowicz, and Watts-Taffe (2011): 1) rich and varied language experiences; 2) instruction in individual words; 3) instruction in strategies for independent word learning, and 4) fostering word consciousness. We found that using iPods as a vehicle for learning new vocabulary to be another successful means of increasing students' interest, understanding, and motivation. Moreover, the new technologies of today and tomorrow will continue to provide teachers with alternative instructional formats that emphasize student expression and explanation beyond traditional pencil and paper tasks to help students broaden and deepen their word knowledge.

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