

CELEBRATING THE STORY OF MY FIRST CONTRIBUTION TO CALL

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In the realm of second language acquisition, investigations of the efficacy of multimedia annotations for learning unknown lexical items has attracted considerable interest during the past decade. This commentary discusses the story of my first contribution to the field of computer-assisted language learning (CALL) 14 years ago. In particular, it sheds light on motivating factors that led me to do so and also presents the intellectual and practical contributions of my study. The commentary concludes by describing some important technological and pedagogical factors that should be considered to fully exploit the potential of an electronic glossary. Within the domains of technology and pedagogy, I identify specific points that cover a wide range of issues and highlight their implications.

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MOTIVATING FACTORS THAT LED TO MY FIRST CONTRIBUTION TO CALL

When I happily received the invitation to write a commentary on my first-ever contribution to the field of computer-assisted language learning (CALL) 14 years ago, I had to travel years back to remember the motivating factors for my study, which would unknowingly become one of the highest-cited articles in the history of *Language Learning & Technology (LLT)*, an outstanding CALL journal. At the time, I had just developed an interest in CALL and had a strong belief that contemporary technological capabilities could enhance second language (L2) reading and accelerate L2 vocabulary acquisition by enabling the simultaneous presentation of target vocabulary in multiple modalities such as text, audio, still pictures, and dynamic videos. In other words, I believed glossing individual vocabulary items via annotations embodied by different modes, media, and forms, could improve L2 acquisition when presented digitally on a computer screen.

When I was a PhD candidate, I maintained close contact with several English as a second language (ESL) learners, mainly to conduct small-scale studies to fulfill my doctoral coursework requirements. In one of my studies, I interviewed a Mexican ESL learner on the specific strategies he used to acquire English vocabulary. In this interview, he told an interesting story about something that happened when he first arrived in the United States knowing only a little English. In a restaurant, when the waitress served his meal and he did not see a ketchup bottle either on the table or served with the meal, he asked, “Where is the checkup?” She looked at him, deciphering what he was trying to say. After some failed attempts, the waitress realized he was asking for *ketchup* but was mistakenly using the word *checkup*. She kindly asked him to wait; after a short while, she brought out a bottle of ketchup. She said, “We call this ketchup” as she pointed to the bottle and pronounced the word ketchup. This incident, along with the multimedia technological capabilities available at that time, made me think we could provide an optimal L2 vocabulary learning environment to ESL learners in which they could acquire English vocabulary in more efficient, innovative ways and in multiple modalities by exploiting multimedia features. After a bit of investigation, I learned I could accomplish this ambitious plan via what is known in the CALL field as an electronic glossary or, more specifically, multimedia vocabulary annotation.

To avoid developing a multimedia glossary environment without consulting the related literature—as was the case with most computerized language learning programs developed in the 2000s—and to examine

the effect of multimedia annotation modes on L2 vocabulary acquisition, I began researching and designing multimedia glosses. I factored in state-of-the-art L2 vocabulary theories, as the lexicon plays a central role in second language acquisition. I then conducted a study to measure the effect of this type of multimedia gloss environment. At the time, I was taking a course on L2 reading, which greatly enhanced my knowledge of L2 vocabulary acquisition and opened my eyes to the potential of electronic glossaries in acquiring unknown or unfamiliar L2 vocabulary words.

In the early 2000s, few studies had undertaken a thorough empirical examination of the L2 reading process in the computer-assisted context and its effect on L2 reading comprehension. In fact, most of the few studies on L2 reading and computer technology focused on hypermedia rather than hypertext and investigated L2 vocabulary rather than reading comprehension. Together, these factors motivated me to examine the effect of annotation features in a multimedia reading environment on L2 vocabulary acquisition.

INTELLECTUAL AND PRACTICAL CONTRIBUTIONS OF THE STUDY

My study was among the first—if not the first—to examine whether simultaneously presenting information about an individual lexical item via multiple modes would improve learning. Although studies on the efficacy of computer-mediated multimodal glosses in vocabulary acquisition existed at the time, no study had compared the efficacy of different types of pictorial annotations. More specifically, the difference between the effect of static pictures and dynamic video on learning annotated words remained uninvestigated. Therefore, I designed my study to investigate the effects of different types of annotations on vocabulary acquisition and, on the microscale, to compare the efficacy of coupling printed text definitions with still pictures and with video.

The study demonstrated that exposing learners to multiple modalities of presentation (i.e., printed text, sound, picture, or video) produces a language-learning environment that can have a significant effect on learning. The overall findings provided a better understanding for curriculum designers, program developers, and teachers of what accounts for students' success in target language vocabulary acquisition via the assistance of multimedia annotations. Specifically, the study found that providing glossary annotations with both textual and visual information supports L2 vocabulary acquisition more than textual information or traditional glosses alone.

As far as theoretical implications are concerned, the study's results supported the generative theory of multimedia learning (Mayer, 1997). This theory holds that the design of multimedia instruction affects the degree to which learners engage in the cognitive processes required for meaningful learning in the visual and verbal information processing system (Mayer, 1997). Thus, presenting a vocabulary item using both words and corresponding illustrations is effective because it helps guide learners' cognitive processes. In vocabulary learning, learners tend to build visual and verbal cues for retrieving stored information from memory. Storing information is generally not a complex task, but retrieving it is often arduous. To make the task easier for learners, we can provide multiple retrieval cues by integrating two different forms of mental representations.

With respect to the study's contribution to the practice of L2 vocabulary instruction, the study demonstrated that incorporating glosses into authentic online texts in multimedia environments can facilitate incidental L2 vocabulary acquisition. Accordingly, my study contributed a more efficient means of teaching target lexical items, primarily by exposing learners to unfamiliar words via multiple resources and providing quicker and more convenient access to their meaning.

CRITICAL ISSUES STILL TO BE CONSIDERED

Many studies on L2 electronic vocabulary glosses have been published since my article first appeared in *LLT*, but various critical issues still require thorough examination. More specifically, researchers need to

consider a myriad of essential technological and pedagogical factors to amplify the potential effectiveness of electronic glossaries in incidental and intentional L2 vocabulary learning. First, studies did not develop practical ways to aid learners in paying equal attention to both visual and audio input, especially audiovisual input from videos, as they interact with multimedia annotation presentations. This unresolved issue is vital because the working memory's processing capacity is limited; to the detriment of audio input, learners predominantly rely on visual input.

Second, an electronic glossary environment requires learners to select relevant information and retain the encountered vocabulary items simultaneously. However, studies have yet to examine ways to help learners effectively manage various stimuli.

Third, various elements in multimedia environments can disrupt the reading process. Determining how to limit these disruptions is imperative. Currently, there is no conclusive evidence that consulting multimedia annotations does not interrupt the process of understanding the text under study.

Finally, studies have yet to identify an optimal interface, platform design, and location for annotated multimedia glossaries. Specifically, there is no consensus on various technological issues that should guide the design of multimedia glosses or on the positioning of multimedia annotations that would best facilitate L2 vocabulary acquisition. The way in which a glossed word is displayed and its location are important technical parameters, especially knowing that cluttered screens hinder readers. Likewise, the literature has yet to identify the best means of ensuring users actually consult the available glossary and motivating them to do so. Although a program may make glosses available to readers, there is no way to ensure readers view each provided electronic entry. Additionally, the method of gloss presentation may affect cognitive aspects of target L2 vocabulary acquisition. Overall, additional resources should be invested in the design of multimedia glosses.

UPDATED PROGRESS

To date, the potential efficacy of multimedia annotations or glosses in both incidental and intentional L2 vocabulary acquisition has attracted many researchers. Early studies focused on comparing the effectiveness of multimedia to that of traditional dictionaries in facilitating L2 vocabulary acquisition, whereas later works focused on further issues, including clicking behavior, different modes of multimedia annotation, the effects of native language (L1) glosses on L2 vocabulary acquisition, and L1 translations or definitions. Recently, researchers have begun to explore areas of investigation such as teachers' and students' perspectives of electronic dictionaries, the locations of glossed words in computer-based annotated texts, and the varying benefits of particular types of vocabulary annotations for learners with certain perceptual learning styles.

Future studies will likely examine multimedia vocabulary annotation based on cognitive psychology theories on memory, working memory, and spaced retrieval in L2 processing. Presumably, these studies will also closely consider all aspects of lexical acquisition, such as input, processing, storage, retrieval, and output, all of which will improve our understanding of how multimedia can enhance L2 vocabulary acquisition.

FUTURE NEEDS OF AN EFFECTIVE ELECTRONIC GLOSSARY

That said, future studies on multimedia glossaries should consider several issues, including (a) learning training, (b) criteria for selecting words to be glossed, (c) accommodating individual differences, (d) learners' proficiency levels and context-specific definitions, and (e) assessment. This section will introduce each effective factor, shed light on the reasons for considering it, and offer some practical suggestions for implementation.

Learning Training

With respect to the issue of learning training, training students on the most beneficial way to utilize an electronic glossary is vital. Most students are accustomed to traditional or printed dictionaries and might be unfamiliar with how to operate and efficiently interact with a multimedia glossary. Informing potential users beforehand of the best ways to use an electronic glossary can familiarize them with both the program features and effective consulting techniques.

Orienting a user to an electronic glossary also reduces the cognitive load imposed on learners in the new computerized instructional environment. Such orientation enables users to exploit their experience with the multimedia glossary to the fullest. This preparatory information can be presented in introductory sessions that introduce glossing features to users and provide practice sessions on how to consult glossed entries. Tutorial sessions should have clear, concise, and useful descriptions of the program content. Instructors can also train students on how to use the electronic features most effectively.

Criteria for Selecting Words to be Glossed

The criteria for selecting the words to be glossed are another important pedagogical consideration. Beyond limiting the overall number of glosses, instructional designers of multimedia glosses (IDMGs) should avoid selecting words based on their intuitive sense or personal judgment. Instead, they should set criteria to guide their selections. When selecting target words, IDMGs can choose between or combine two approaches: systematic selection and less systematic selection. Systematic selection involves consulting or basing the selection on the available word lists and frequency corpora (e.g., Francis & Kucera, 1982; Hindmarsh, 1980). Some words occur frequently, while others appear only in specific contexts. Overusing low-frequency words can have a comical effect. Thus, Nation (1990) proposed selecting words based on their usefulness and importance in the text. Furthermore, readers often see no point in looking up words that seem familiar to them and, therefore, refrain from doing so (Black, Wright, Black, & Norman, 1992).

In contrast, the second selection method (less systematic selection) entails asking representatives of the target user group to read the selected text and highlight the words they do not know. This activity enables IDMGs to measure pre-knowledge of the keywords. IDMGs can also ask the teachers of the target group to provide insight based on their experience into whether the target group would be familiar with the selected words.

Learners' Proficiency Levels and Context-specific Definitions

On this note, advance consideration should be given to learners' proficiency levels. IDMGs need to tailor definitions to learner proficiency levels and abilities. Definitions should be concise and include simple syntactical structures and basic vocabulary. Additionally, the suggested definitions for the target words should fit the context of the text at hand. The relevance of a definition is significant. When readers perceive that a definition helps them understand a text, they are more willing to pay attention to word meaning (Hulstijn, 1993; Hulstijn, Hollander, & Greidanus, 1996). According to Reinking (1990), one advantage of an electronic glossary over a traditional dictionary is that it provides immediate access to context-specific definitions. Context-specific definitions eliminate the need to determine which of the several dictionary meanings apply to a given context. Echoing this argument, Leffa (1992) contended that context-specific definitions free readers from making a decision concerning which definition entirely relates to the passage being read.

Accommodating Individual Differences

The accommodation of individual differences is also important in electronic glossary design. Each student brings a unique approach to learning experiences. Language educators continue to acknowledge the effect of individual differences on vocabulary learning in relation to rapid advances in the application of

instructional and educational technology (e.g., Chun, 2001; Plass, Chun, Mayer, & Leutner, 1998; Reinking, 1990). Computer technology enables us to negotiate an electronic glossary in an individualized fashion. Thus, accommodating individual differences entails providing learners with different modes of learning based on individual needs and allowing learners to choose their preferred mode of learning to derive meaning from the studied text. Accommodation ensures the presentation of information is tailored to suit individual learners and particular situations. In particular, one can design an electronic glossary to provide personalized adjunct aid that accedes to the user's preferences and learning styles. For example, the program could provide options for selecting different types of dictionary information for each word, such as definitions in the target language, translation into L1, pronunciation, and verbal and visual explanations.

Assessment

Finally, studies should examine several factors concerning the assessment of learned lexical items offered in an electronic glossary. First, the mode of assessment and the presentation of the vocabulary should match. In other words, a link should be established between the way target glossed vocabulary is presented and the assessment measures that the multimedia glosses program employs. Second, assessment exercises should move beyond the discrete-point level—that is, the level at which users check for matching items, provide fill-in-the-blank responses, and complete crossword puzzles. Given the current capabilities of computers, assessment should provide opportunities to use introduced vocabulary in new situations. For instance, programmers can utilize notebooks and word-processing capabilities to pursue novel uses of the newly acquired lexical items. These types of assessment exercises offer multiple response types and produce more active learning while exploring and processing vocabulary from various modalities, including verbal (textual definitions) and nonverbal (static pictures, dynamic video, and animations).

FINAL REMARKS

The CALL field has evolved significantly since I first published my study on multimedia vocabulary annotation. Much has been accomplished, yet much more remains unexplored. It is expected that forthcoming studies will consider conducting an in-depth investigation, be grounded on second language theory and language pedagogy, thoroughly tackle the issue of cognitive perspective, and adhere to principles of designing multimedia instructional materials.

ABOUT THE AUTHOR

Khalid Al-Seghayer earned his Ph.D. in Applied Linguistics from the University of Pittsburgh in 2003. His research interests include CALL and L2 reading. He has taught English in the Kingdom of Saudi Arabia and the United States of America. His work has been published in *TESOL Quarterly*, *Language Learning & Technology*, *CALL Journal*, *Internet TESL Journal*, *CALICO Journal*, and *CALL-EJ Online*. His recent books are *English Teaching in Saudi Arabia: Status, Issues, Challenges, Various Thoughts Concerning Teaching and Learning English*, and *Real Face of Saudi Arabia: Critical Insider Perspectives on Educational, Lifestyle, and Social Issues in the Kingdom*. He served as the chair-elect of the EFL Interest Section in TESOL, the editor of the Non-Native English Speakers (NNEST) Newsletter in TESOL, the chair-elect of the NNEST in TESOL, and the editor of the *CALL Media Software of Reading Matrix Journal*. He was the chair of the English Department at Imam University, and now is the chair of the English Department at Saudi Electronic University. He serves currently as an editorial board member and reviewer for a number of journals.

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