

CREATING ELECTRONIC 'LANGUAGE-RICH ENVIRONMENTS' FOR SECOND LANGUAGE LEARNERS AT THE NOVICE LEVEL

Kathleen A. Bueno

Southern Illinois University at Edwardsville

Researchers in second language acquisition have highlighted the importance of "language rich environments" (Hatch, 1980) and "genuine communication" (Wong-Fillmore, 1989). In a language rich environment, the students have continuous access to the target language from a variety of sources. The language that students have access to promotes "genuine communication" ---the raising of topics of interest to the students and the expression of ideas about those topics. Interactive video programs appear to bring new possibilities for creating language-rich second language learning environments and the popularity of these new resources is evident (Yu, 1995). What remains to be determined is the value that such resources have for beginning students.

This article outlines the essential features for creating language-rich multimedia environments. The article also describes learner interactions with language samples in these environments and examines the nature of meaningful learner interactions with these types of electronic resources. The information presented focuses on data from an ethnographic study of the integration of an electronic multimedia environment in a beginning Spanish course at a Midwestern university. Data sources include navigational files, answer files and ethnographic interviews. Random samples were used from a group of ninety-one learners during a sixteen month period. The descriptions that follow provide insights into the role of new electronic resources in second language acquisition.

Essential Features of Language-Rich Electronic Environments

In addition to providing continuous access to the target language in a variety of forms that focus on genuine communication, language-rich electronic environments for novice learners are characterized by a number of other essential features. First, leaders in second language pedagogy advocate that target language samples in electronic resources utilize mostly familiar vocabulary and grammatical structures (Postovsky 1977, Hatch 1978 and Lee and Van Patton 1995) and that they also contain novel linguistic elements (Krashen 1985, Larsen-Freeman and Long 1991; Lee and Van Patton 1995 and Omaggio-Hadley, 1993). Lee and Van Patten add that the development of language proficiency requires "structured input" (1995 : 32) and "structured output" (1995 : 121). Structured input refers to language that features one function and one form. Structured output involves students in activities that require the learner to access a particular form or structure in order to exchange previously unknown information. Language input should expose students to authentic language,

that is, language samples created by native speakers for native speakers, or it should provide exposure to simulated authentic language, language by near-native or native speakers designed to highlight speech normally used in communication within the target culture (Lund, 1990; Rivers (1995); and Phillips, 1995).

Researchers in educational technology believe that the key to fostering second language acquisition resides in the interactive qualities of the electronic environments (Noblitt 1995 and Stern 1995). Patrikis specifies that meaningful learner interactions entail "purposeful activities" (1995 : 10). For beginning students, these purposeful activities include recognizing, remembering, rehearsing and associating meaning with words and phrases. They also involve identifying main ideas in familiar content, practicing novel and familiar phrases in controlled activities and using new expressions to communicate an idea (Bueno, 1996).

Research studies of second language learner interactions with multimedia indicate that open learning environments with an appropriate level of user control and a minimum of well-chosen restrictive features seem to promote skill development (Noblitt, 1995). Open learning environments are characterized by multiple pathways and learner control of the sequence of the learning experiences. An appropriate level of user control allows learners to stop, rewind, forward and replay any portion of the video instantaneously at all times. In addition, learners need constant access to a variety of mediating resources that include glossaries, transcripts, grammar helps, cultural information, and access to audio versions of isolated words and phrases. This level of control allows learners to tailor their interactions to meet their learning needs (Herron and Moos, 1993; Nicholas and Toporski 1993; Johnston and Milne, 1995; and Bueno, 1997).

Well-chosen restrictive design features guide students to attend to important features of the target language samples. Restrictive design features include controlling how the video segment is presented (image only, audio only, both image and audio) and controlling accessibility of mediating resources (access to transcripts only after viewing the video, visibility of activities only after the video segment has been played or access to the video only after precommunicative activities that match key vocabulary with appropriate graphic representations have been completed). In so doing, the restrictive design features seem to direct students to develop navigational strategies that parallel the kinds of metacognitive second language learning strategies used by second language learners (Vandergrif 1997, Johnston and Milne 1995; and Bueno and Nelson 1998).

Characteristics of Classroom Discourse and Interactional Learning Sets

Before discussing the types of learner interactions with target language samples in multimedia programs, it is essential to examine the underlying structure of student interactions with multimedia. It is also important to note that discourse in learning environments differs substantially from conversational discourse in other

environments. In his 1979 ethnography, Hugh Mehan discovered that classroom discourse occurs as "variations of ordered triples instead of as the adjacency pairs associated with everyday discourse" (1979 : 183). These ordered triples form interactional sets that represent a valuable tool for understanding classroom learning.

Lessons, according to this schema, are made of interactional sets that contain an initiation, a reply and an evaluation. In the initiation, the teacher usually elicits information. A student reply, an attempt to provide the information sought by the teacher, usually follows. Finally, the teacher provides some type of evaluation. Evaluations take several forms: a correction, an affirmation, a clarification or praise. The interactional sets reflect the negotiated nature of classroom learning. By analyzing classroom interactions, Mehan contended that educators could gain an understanding of the types of learning environments that serve as facilitators for learning skills (1979 : 199).

Learning sessions with electronic environments also contain interactional sets. These interactional sets are highly complex in nature. This complex nature relates to the underlying structure of laboratory sessions with multimedia. Laboratory sessions commence with a student selection that elicits a computer-generated initiation featuring a short segment of conversational discourse or a computer-generated presentation of information about the target language or culture. Students respond to these initiations in a variety of ways. For example, students respond to conversational discourse samples by indicating their understanding in the activity box or by seeking clarification through the mediating resources. The resources either allow students to understand the discourse or lead them to seek repeated or additional clarifications. In other interactional sets, students respond to information given about the target culture or language by seeking more information or additional kinds of information. For example, a student may access the meaning of a lexical item and then access the way the word sounds. As a result, computer sessions involve several distinct interactions composed of selections, presentations, initiations, responses and confirmations that occur in tandem. Due to their complexity, computer generated interactional sets require both user skills and user strategies that allow learners to negotiate meaningful sessions with multimedia (Chapelle and Mizuno 1989, Johnston and Milne 1995, and Bueno and Nelson 1998). By examining samples of the interactional sets occurring in these practice sessions, practitioners and researchers can gain insights into the types of electronic resources that constitute language-rich environments.

Listening Interactional Sets With Multimedia

During sessions with the multimedia program, some students engaged in interactional sets that featured listening interactions. The data regarding these types of interactions are based on twenty-two randomly selected sessions. Students in this group listened to the entire video segment or a substantial portion of the video segment an average of twelve times. They also replayed a word or phrase an average of forty-three times. In addition, students working on listening interactions tended to

respond to activities that required them to identify key words or to identify or write main ideas. They did not answer activities that required providing details or creating a similar written sample of communicative exchanges in the target language.

In order to respond, students utilized an average of two kinds of mediating resources per session. These mediating resources included access to information on lexical, grammatical and cultural information; control of the video to search and replay portions of the video; and access to the activity box to preview types of responses that they would need in order to answer appropriately conversational initiations. Figure 1 provides a summary of the resources accessed during listening sessions. Twenty-three per cent of the students accessed the

Resources					
	Information	Search	Preview	Scan	Stop
% of users	23%	59%	18%	23%	95%

Fig. 1: Resources used in listening interactions

information box. Fifty-nine per cent of the students conducted searches and replayed smaller portions of the video. The number of searches conducted averaged two per session. Eighteen per cent of the students previewed all activities reading them carefully and twenty-three per cent scanned some activities either before or after viewing the video segment. Accessing meaning from the video segments appeared to depend on the accessibility of a variety of mediating resources.

Some students also began using these resources in combination. Figure 2 summarizes these interactions. Eighteen per cent engaged in sequences of

	Combinations of Resources	
	Information/Scan	Video/Activity
% of users	18%	59%

Figure 2: Combinations of Resources in Listening Interactions

interactions that featured alternating between accessing the information box and scanning the activities. Fifty-nine per cent of the students participating in sequences of interactions in which they replayed a small portion of the video segment and then scanned the activities. Listening interactions seem to entail a diversity of interactional patterns that centered on extracting the gist of the conversational exchanges.

Navigational files revealed the richness of the listening interactions that take place during sessions with the software. During one session a student appeared to have skimmed the second comprehension activity (nine second pause) before playing the video. The activity required that she complete a cloze passage based on the

dialog in the video segment. After playing the video, she conducted a brief search utilizing the forward button (one second) and played a seven-second portion of the video. Thirteen seconds later she accessed the button to check her answers for the second comprehension activity. After checking her answers, she played a four-second portion of the video and then forwarded to search for another portion. She played a five second portion and reversed to search again. Finally, she played a six second portion. She appears to have gone back to the video to listen to the answers before going on to the next activity in the lesson. She had developed two strategies: previewing the activities to provide focus for her listening and replaying the video segment after she was done with the activities to listen again for the right answers. She continued using these strategies in subsequent sessions.

The navigational data also highlights both the efficiency of her approach to sessions with the software and the depth of the conceptual understanding that her experiences afforded. It only took the student two minutes to view the video, to select several sections to replay, to complete the activity, to check her answers and to replay the answers to hear them one more time. In addition, her answers indicate that she was actively engaged with the video in a number of ways. For example, with the cloze passage, she appeared to use the lesson to practice recognizing phrases. She played the video twice and then accessed the transcript. After four seconds, she conducted a search through the video segment to hear certain portions and finally played the entire segment again. She seemed to be using the mediating resources to help her access the meaning and phonemic information about unfamiliar words and phrases. After these interactions took place, she successfully completed nine of the ten true or false items related to a very challenging authentic video segment. These types of interactions with multimedia seem to guide students to gain a deeper conceptual awareness of the tasks involved in successfully understanding a message in a second language.

In a study of listening strategies among second language learners of French, Vandergrif found that "metacognitive strategies play a key role" in determining what listeners attend to in discourse (1997 : 406) and that what they focus on "is crucial for successful comprehension" (1997 : 405). Herron and Moos found that partial transcripts of portions of video segments that are difficult for beginning students to comprehend also "highlight the phonemes normally left out, elided or otherwise morphologically altered, in a spoken exchange (1993 : 483). Nicholas and Toporski even found that advanced students watched particular episodes "to isolate and understand particular phrases that they missed initially" (1993 : 473). In a manuscript describing the strategies invented by learners of Spanish using an electronic environment, Bueno and Nelson (1998) found that students used the activity box as a resource for determining a focus for their listening. These examples lend support to the hypothesis that the interplay of the electronic environment's directing and the students' control appear to facilitate the metacognitive negotiations that underlie the development of second language listening comprehension skills.

Complex Interactional Sets With Multimedia

In addition to participating in sessions with the software that centered on listening interactions, students in the study also engaged in longer sessions with comparatively more complex interactional sets. These sessions averaged thirty-five minutes in length. A random sample of sixteen students engaged in complex interactions employed an average of three mediating resources. Complex interactional sets were characterized by increased usage of the mediating resources already mentioned. Figure 3 documents this increase. The average increase in

Resources				
	Information	Search	Scan	Stop
% of users in Listening interactions	23%	59%	23%	95%
% of users in complex interactions	100%	94%	69%	100%

Figure 3: Increased Use of Resources in Complex Interactions

usage was forty-one per cent. It is interesting to note that students in this group were no longer previewing the activities before viewing the video segments. In addition, students began utilizing other resources that had not been accessed in the listening sessions. Figure 4 reports these findings. These resources included the help button,

Resources			
	Review	Help	Transcript
% of users	50%	19%	19%

Fig. 4: Resources used in complex interactions

the transcript button and reviewing the activity box after viewing the video. Fifty percent of the students employed the strategy of reviewing the activities. Nineteen per cent accessed both the help button and the transcript. The help button provided clues from the video segment. These clues consisted of smaller portions of the video accompanied by graphics and written text or slower, clearer audio versions. The transcript button provided a written version of the dialogue from the video segment with vocabulary links to both the meaning and pronunciation of selected words in bold type. Those students utilizing the help button, accessed it an average of seven times per session. Students accessing the transcripts averaged two times each session.

Students in this group also exhibited increased usage of the mediating resources in combination. Figure 5 on the next page summarizes these findings.

Eighty-seven per cent of the students in this group engaged in sequences of

	Combinations of Resources		
	Information/Scan	Video/Activity	Video/Information
% of users in listening interactions	18%	59%	0%
% of users in complex interactions	31%	87%	12%

Figure 5: Increased use of resources in combination

interactions that involved alternating between viewing the video and accessing the activity box. The average number of these types of sequences per session was five. Thirty-one per cent of the students continued to alternate between accessing information and accessing the activity box. Students utilizing this strategy averaged two sequences per session. A few students (twelve per cent) alternated between viewing the video and accessing information. The students employed this strategy once a session on the average. Suggested purposes underlying these increasingly complex interactions with multiple resources surfaced through analyzing the answer files and the interview data.

The answer files reflected abilities expected at the novice level when responding in writing (Omaggio-Hadley, 1993 : 292). These answers included primarily one or two word responses. Occasionally complete sentences appeared. These sentences included sentences that had appeared in the textbook, that were used in structured oral practice in the classroom or that were key phrases modeled in the video segments in the electronic environments. These sentences appeared to have been memorized or had become highly familiar to the students through exposure.

Ethnographic interviews with the students revealed more about the nature of these complex interactional sets. In talking about their experiences with the software, students identified two crucial goals for beginning second language learners: "finding out the right way to do something" and "knowing how to change" unacceptable utterances. For this reason, students found that interactions that allowed them to access and manipulate the authentic speech samples were valuable. According to students, the video segments showed "gestures and non verbal ways to communicate," "seeing their lips move and how they pronounce words," and "different ways to express things." Another student concluded that he used the activity box to practice:

how to say things...like what I write as what I'd have to say if I were carrying out a conversation

These complex interactions with samples of authentic conversations and opportunities to engage in communicative activities appeared to simulate aspects of conversation.

Johnston and Milne (1995) reported in an empirical study that the use of a multimedia program altered the nature of classroom discourse. The multimedia program that they used, "The Teacher's Partner," modeled speech for emulation, described contexts that cued appropriate choices of words and phrases, and gave context specific grammatical explanations (1995 : 317). Johnston and Milne posit that access to speech samples with these kinds of background information promote "particularly memorable language for students" that result in conversational classroom interactions (1995 :327). Instructors assigning lessons on the software used for this study reported similar classroom experiences. In one classroom, for example, the students were instructed to draw a family tree and to prepare an oral presentation about their family. One of the students began her presentation with the following phrase: "Te quiero presentar a mi familia" <I want to introduce you to my family.> This phrase was not in the textbook and had not been presented in class. It was featured, however, on the lesson assigned for use in the laboratory that week. Johnston and Milne posit that electronic learning environments may serve as scaffolds to support the development of oral proficiency.

Conclusions and Suggestions for Further Research

The key questions of this study centered on determining what kinds of electronic environments provide language-rich environments and what types of interactions with these environments are meaningful interactions for second language learners at the novice level. Data from this study and from similar studies indicate that language-rich environments provide repeated access to authentic communicative speech samples that direct their attention to ways to express themselves in particular communicative situations and that are accompanied by a variety of mediating resources. Second language learners extract meaning and useful expressions for communicating ideas in the target language from repeated exposure to and control of these authentic language samples. In addition, the data suggests that meaningful interactions center on student responses that allow them to confirm their understanding of the language samples and on opportunities to think about or rehearse communicative responses.

The data also suggests a role for multimedia in second language programs. Some theorists believe that the process of scaffolding is essential for the development of complex second language skills like aural comprehension and speaking (Applebee and Langer, 1983 and Palincsar, 1986). Scaffolding provides temporary assistance that supports the learners' ability to perform an emerging tasks. For example, listening comprehension subsumes a number of types of subtasks (Richards 1983 and Lund, 1990). Lund has identified a number of possible types of response activities that facilitate the development of listening skills (1990 : 111). These activities include such tasks as identifying key words, phonemic distinctions and semantic cues to meaning by matching pictures and by filling in the missing words from a written transcript

(1990 : 235). Another task focuses on demonstrating comprehension of the main idea by preparing an outline, answering questions or creating a similar written language sample. Lund advocates that learners interact with the same speech sample more than once and that they learn "to do new functions with familiar texts" (1990 :112). The listening interactions with the electronic environment described in this study indicate that the software promoted the development of listening skills.

Exposure to authentic communication samples and opportunities to first attend to these messages to extract understanding seem to represent one strategy for obtaining oral skills (Ervin-Tripp 1974 and Postovsky 1977). As learners listen to extract meaning, they focus on ascertaining the applicability of semantic forms to different contexts (Hatch, 1978) and determine useful formulaic expressions for expressing ideas (Lyons, 1968; Ellis, 1985; Wong-Fillmore 1989; Yorio, 1980; and Hernández-Chávez, 1977). Hatch believes that second language learners need meaning to access forms (1978:153). Yorio posits that formulaic expressions, of language acquired as unanalyzable chunks, allow learners to organize speech by forming scripts that meet their communicative needs. One student in this study actually demonstrated this process. After watching a video segment in a restaurant setting, she correctly matched a series of communicative exchanges found in the dialogue. For example, she matched "una mesa" <a table> with "para dos" <for two>. Next, she matched several novel combinations of phrases such as "una mesa" <a table> and "es muy buena" <is very good> to see if they would be accepted by the computer. During complex interactions with the software, second language learners appeared to compensate for their limited knowledge of the target language and to develop scripts for communicating in the target language.

The challenge for practitioners and researchers alike resides in exploring how new electronic resources scaffold the development of second language skills. In order to assess the types of meaningful interactions that foster skill development, attention must be given to the experts-- the second language learners. Students using the electronic learning environment for this study reported that the software provided short messages related to what was being studied in class and that focused "on certain things" using authentic language that was "a little bit slower." Students added that these messages were also easier to understand because of the speakers' actions and because samples of several related conversations were included in the lessons. Students also stated that they benefited from the activities that allowed them to match meaning with target language words and that allowed them to hear "different ways to say things." In addition, students reported that the ability to "control the computer" as they practiced "hearing people speak and trying to catch what they are saying" was very helpful. Finally, students noted that lessons that allowed them "to see how much I understood," to type in "what I'd have to say if I were carrying on a conversation," and to see "the correct answer" were essential. Continued research will determine if these new resources provide meaningful interactions for students that lead to second language skill development.

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