

Recipe for Foreign Language Literacy: Video/Caption Technology and Foreign Sign Language as Ingredients

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Abstract

Video/caption technology and foreign sign language can be successful ingredients for developing literacy skills in a foreign language. Using this technology, we – the authors – produced a unique Spanish reading program for American deaf students. In this paper, we describe the reading program, explain the theoretical rationale behind this combined approach, and discuss the results of the experimental assessment procedure.

The project consists of Spanish readings that go along with Spanish-captioned narratives in Costa Rican Sign Language (LESCO). The assessment shows that the students learned to associate specific LESCO signs with specific words in Spanish, thus improving vocabulary retention. Additionally, the LESCO stories created a scaffold for the students to approach the written texts simultaneously in a top-down and bottom-up fashion. This helped their global comprehension and improved their motivation towards the reading task.

Introduction

This paper discusses a Spanish reading program that is specifically designed for American deaf students. This program combines written Spanish and Costa Rican Sign Language (LESCO) through the use of video and caption technology. Specifically, the program consists of ten traditional Costa Rican legends that are professionally videotaped in LESCO and coordinated with a booklet, containing Spanish written versions of the same stories. Additionally, the videotapes are captioned in Spanish. The written stories range from the basic to the basic-intermediate level of Spanish, and they feature many of the key grammatical structures that are typically covered in a first year Spanish course. This paper explains the rationale for producing such a combined reading program, provides some theoretical background on reading strategies that are typically used by deaf individuals and on the cognitive processes that are generally involved in reading, and discusses the experimental design and results of the assessment of this product, conducted at Gallaudet University in the spring of 2001. Finally, conclusions will be summarized.

Program rationale

This combined LESCO/Spanish reading program is the first of its kind in that it explores the benefits that simultaneous exposure to foreign signs and a written language can have for deaf students that are acquiring literacy skills in an unfamiliar foreign language. Additionally, the program also addresses the intricate cultural and linguistic relationship that exists between the signed and the written language of a particular community.

It is well known that English is a second language for many American deaf individuals and that this fact, along with other factors that have been widely discussed in the literature, may pose difficulties in the acquisition of English literacy skills (Quigley et al., 1976; Wilbur, 1977; LaSasso & Davey, 1987, among others). Little has been said, however, about the difficulties and special needs that deaf students have when learning a totally unfamiliar foreign language – that is, a language to which they have not had any exposure through cultural contact. Most American deaf students who start learning a foreign language in college have never had any previous exposure to it. The same challenges that they may face in acquiring English literacy skills are presented to them when faced with the task of learning the written form of a foreign language to which they have no direct exposure. To this challenge one has to add the facts that the vocabulary is completely unfamiliar and that the unfamiliarity of the language leaves the students at a loss for any clues that can help them develop a phonological coding system for the language, a key reading strategy.

By combining foreign signs with written texts, the program gives students an alternate tool to decode the written vocabulary in context through access to contextualized, linguistic visual cues. The authors' claim is that the LESCO presentation of the stories allows the students to make foreign sign-written word associations that facilitate vocabulary decoding and retention. Additionally, watching the signed stories before reading the full Spanish texts allows the students to approach the written texts in a more holistic and contextualized manner.

Below is some background on reading strategies that are commonly used by deaf readers. What follows is a more detailed discussion of how the combined program can help the readers tap into some of these strategies.

Background on reading strategies

Readers use a variety of strategies for temporarily storing written information in their working memory.

One such strategy involves phonological coding (Shankweiler and Crain, 1986, among others). It is well known that phonological coding is a strategy that is commonly used by deaf readers, too (Conrad 1979; Hanson, 1990; Hanson, Goodell, and Perfetti, 1991). For some deaf readers, the coding may correspond with the actual pronunciation patterns of the language, and for others the phonological coding might be rather idiosyncratic but, nevertheless, quite effective in segmenting the basic units of the text (Hanson and Fowler, 1987). Another strategy that is known to be used by deaf readers in order to keep information in their memory buffer is to associate specific signs from the reader's sign language with specific printed words (Lane, Hoffmeister, and Bahan, 1992).

While it is possible that over time deaf readers will develop a phonological coding mechanism in an unfamiliar foreign language, it is unlikely that this strategy will be successfully employed at the beginning learning stage when the students are first presented with an unfamiliar spelling system and subjected to phonotactic constraints different from the ones they are used to seeing in English – with no access to the sound system of the language to assist them in decoding the spelling. Fostering associations between the unfamiliar written words and linguistic visual cues (in the form of foreign signs) might provide an alternative decoding strategy at the initial stages of literacy acquisition. In particular, the program fosters sign-written word associations by means of the careful timing of the Spanish captions that the students see on the screen while they watch the LESCO stories. The captions are simple and short, and they highlight the key Spanish vocabulary that the students will later encounter in the written texts. Classroom use of the videotapes indicates that, in fact, the students make quick connections between signs and captions and that these connections enhance vocabulary retention (both spelling and meaning) and global text comprehension.

Some clarification is in order regarding the authors' choice of signed language for this program and the extent to which the signed stories are accessible to the students. While the written form of Spanish is rather uniform across most countries in Latin America and in Spain, no such uniformity is found across Spanish-speaking countries regarding the sign languages used by their deaf communities. Since sign languages are naturally occurring languages, each country may have one or more sign languages that may be mutually unintelligible, regardless of the mutual intelligibility of the spoken language. In selecting a sign language for the program that would be culturally related to one of the Spanish-speaking countries, we were thus presented with many choices. We opted for Costa Rican Sign language mainly because it is closely related to ASL, due to continued contact between the two languages through historical and educational links between the two communities. In

fact, it is estimated that in educational settings, LESCO shares between 70-80% of its vocabulary with ASL. LESCO thus provides a perfect balance for the program's purposes. On the one hand, the signs and some aspects of its grammar are different enough from ASL as to not to completely give the stories away to the students. On the other hand, its similarity to ASL allows the students to understand enough of the stories so as to contextualize the Spanish vocabulary presented by the captions. Thus, rather than adding an extra burden by simultaneously presenting the students with foreign signs and foreign written vocabulary, the LESCO signs provide a tool to decode the captions in context and to retain the Spanish vocabulary by associating written words and signs. The authors would like to emphasize that the signed versions are not one hundred percent accessible to the students. However, rather than throwing the students off track, the relative unfamiliarity of the LESCO signs motivates the students to read the full-fledged Spanish texts in order to achieve a more complete understanding of the stories.

Cognitive processes involved in reading

The approach used assumes the theory that the reading process happens both simultaneously bottom-up and top-down. That is, on the one hand, the reader focuses on the bottom, or more basic, units of the texts (letter combinations, phonology, syntax) and then builds the meaning of the text from these; on the other hand, the reader also builds the meaning of the text from previous, general knowledge and expectations (about the subject, about the world, and about the language) and then deduces the meaning of the bottom units of the text from the top-down. Providing a scaffold or a format previous to approaching written texts is in line with recent theories and methodologies on literacy development (Paul & Quigley 2001). Without a frame of reference that the beginning reader can utilize, a bottom-up based reading process yields less than optimal results, especially when dealing with a foreign language, where most bottom text units are unfamiliar and uncodifiable by the reader. Watching the LESCO stories before approaching the written texts helps beginning readers in two ways: as discussed above, it assists them in decoding and retaining vocabulary, thus facilitating the bottom-up cognitive process. Additionally, watching the videotapes provides the readers with a general frame of reference on which they can later rely in order to deduce the bottom units of the text in an alternating or simultaneous top-down and bottom-up fashion.

Assessment

The authors assessed the effectiveness of this program in the classroom setting by comparing the reading performance of three intermediate Spanish classes at Galaudet University. The results of the pilot assessment are positive and point to the LESCO videotapes as an effective

tive and motivating tool for developing reading skills in Spanish among deaf students. Additionally, we also collected anonymous answers to a questionnaire that requested information about attitude and motivation towards the reading task. Incorporating foreign sign language improves motivation and enhances cultural interest, and this is discussed below.

In assessing the effectiveness of the combined LESCO/Spanish tool, we posed the following questions: 1) do the LESCO videotapes enhance global comprehension of the written texts by facilitating the top-down cognitive process? 2) Do the captioned LESCO videotapes improve Spanish vocabulary recognition and retention by helping the students establish contextualized connections between signs and captions? The hypothesis was that watching the videotapes previous to reading the texts would in fact help the students' reading task by familiarizing them with the vocabulary and, thus, reducing dictionary dependency and frustration. Additionally, the hypothesis proposed that the videotapes would provide the students with a scaffold that would help them deduce the basic units of the text in a contextualized manner.

Evaluation design

A total of thirty deaf students enrolled in three Spanish 112 classes (second semester Spanish) at Gallaudet University were involved in this assessment. All three groups were taking Spanish 112 with the same professor at the time when the assessment took place. The students read four of the Costa Rican stories at different points in the semester. Each text was given to them twice in class with an interval of about ten days between readings. For each story, all the groups first read the story in class, without watching the videotape. Then, they answered some comprehension questions and completed a fill-in-the blank vocabulary retention exercise. Both the reading and the students' answers were collected, and the number of correct answers was calculated for each student. Ten days later, the students read the same story again. This time, the two experimental groups watched the LESCO rendition one time right before reading the text. The control group simply read the story again without ever watching the videotape. The students in all three groups were again asked to complete the same comprehension and vocabulary exercises. The authors then measured how much each student's score improved between the first and the second reading of each story. We also checked to see whether there was any correlation between each student's score improvement and the group the student was in.

Results

As shown in table 1 (appendix I), the results show a positive trend. The mean improvement scores for each reading are higher for the students who were in the two experimental groups than for the students who were in the control group. That is, the subjects

who watched the videotape before reading the text for the second time show a larger score improvement with respect to the first time they read the text than the students who simply read the text twice. Score improvement showed up both in the comprehension questions and in the vocabulary exercise. The authors conclude that this is due to two factors. On the one hand, the captioned videotapes encouraged written word-sign associations that fostered vocabulary decoding and retention. On the other hand, we believe that the videotapes facilitated the global reading task by activating the top-down cognitive process.

While one might argue that the score improvement observed in the experimental groups could be due to the fact that they had a more extensive exposure to the vocabulary through the captions and through the written texts, this explanation is unlikely. This is because the students were able to answer the comprehension questions while they had the texts in front of them and, therefore, there was no limitation as to the number of times they could go over the texts and over the vocabulary.

The experimental groups seem to have done better because they were more able to decode the vocabulary and comprehend the text more globally. That is, citing Krashen's 1996 key terminology on literacy acquisition, the written input was more comprehensible to the students if they watched the videos first. Again, here we would like to emphasize that LESCO is different enough from ASL as to not completely give the story away to the students before they read the texts. The comprehension questions were carefully designed to test comprehension of the written texts, not of the videotapes. In fact, the written texts contain some details that do not appear on the LESCO stories and whose comprehension did not depend on comprehending the signed version. What the LESCO stories provided was a general, contextual frame that made it easier to deduce the content of the written stories (in a top-down fashion). They also provided contextualized familiarity with the basic vocabulary that facilitated the bottom-up reading process, too.

At the end of the assessment procedure, we distributed an anonymous questionnaire requesting feedback from the subjects in the two experimental groups about the reading program and about their overall attitude and motivation regarding the reading task (see appendix II). The subjects' answers reveal that they felt the videotapes enhanced their comprehension and their vocabulary retention and, no less importantly, they reveal that the LESCO videotapes motivated them to read the stories and made the reading task more culturally relevant and enjoyable.

Conclusion

To summarize, as we hypothesized, the video component of the combined LESCO/Spanish reading pro-

gram provides a scaffold that later facilitates deducing the bottom units of the written texts. Enhancing top-down cognitive processing in reading is particularly relevant in a situation in which the bottom information is in an unfamiliar foreign language to which the readers have had limited exposure. As reported in Kelly 1995, average deaf readers seem to compensate for their limited ability to process texts in a bottom-up fashion by relying on prior knowledge which activates the top-down processing of information. This is in contrast to skilled, deaf readers whose bottom-up and top-down processing is more balanced.

While one would not want to make the students dependent on a top-down reading strategy only, given Kelly's 1995 findings that skilled readers use a more balanced reading strategy, it seems unrealistic to expect beginning students of a foreign language to be able to rely on a bottom-up strategy before they become sufficiently familiarized with the vocabulary and the spelling system of the language. This is where the context provided by the videotapes comes to the rescue. Importantly, however, the improved results of the experimental groups over the control group in the vocabulary task also indicates that the videotapes enhance vocabulary decoding and retention, thus helping a bottom-up approach to the text too.

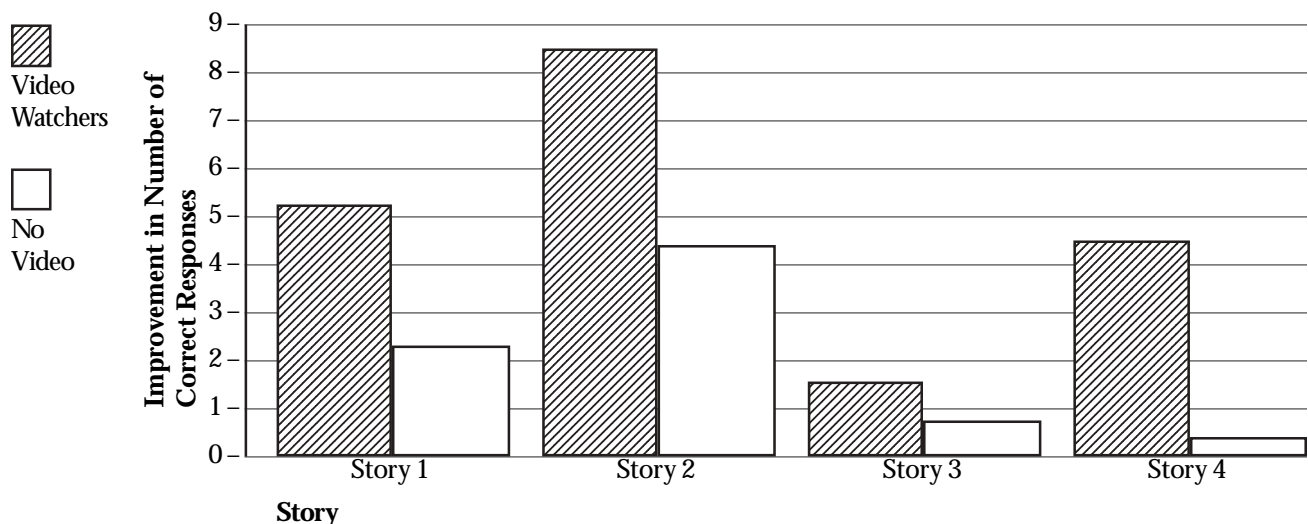
In addition to the practical advantages of incorporating foreign signs as a way to aid the reading task in a foreign language at the early stages of foreign language acquisition, the program recognizes the cultural and linguistic value of the sign languages associated with foreign deaf communities. Given the growing interest in research in signed languages both inside and outside of the United States, incorporating foreign sign language in the foreign language curriculum for deaf stu-

dents is only logical and fair. Foreign signs motivate deaf students to learn, and they raise awareness about the cultural and linguistic relationships that exist between the language of a particular deaf community and the coexisting, written form of the spoken language of the hearing community.

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Appendix I. Table 1 Mean Response Improvement



Paul, P. and Quigley, S. (2001) *Language and Deafness*. San Diego, CA:

Singular/Thompson Learning.

Quigley, S., Wilbur, R., D., Montanelli and Steinkamp, M. (1976). *Syntactic structure in the language of deaf children*. Urbana: University of Illinois, Institute for Child Behavior and Development.

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Appendix II.

The numbers under each letter indicate the number of students who circled that letter as their answer. A total of twenty students from the two experimental groups answered the questionnaire.

Please, answer the following anonymous questionnaire by circling one of the letters (A, B, C, D). **A is the most positive, and D is the most negative.**

1) Do the Costa Rican Sign Language (LESCO) videotapes make the Spanish readings **easier to understand**?

Very much so **A**₁₂ **B**₄ **C**₄ **D** Not at all

2) Do the LESCO videotapes help you understand the Spanish readings **more in-depth**?

Very much **A**₁₀ **B**₄ **C**₅ **D**₁ Not at all

3) Do the LESCO videotapes help you **deduce the Spanish vocabulary** on the written texts?

Very much **A**₉ **B**₉ **C**₂ **D** Not at all

4) Do the LESCO videotapes help you **remember the Spanish vocabulary** better?

Very much **A**₈ **B**₉ **C**₃ **D** Not at all

5) Do the LESCO videotapes help you **understand the Spanish grammar** on the readings?

Very much **A**₅ **B**₁₂ **C**₂ **D**₁ Not at all

6) Do the LESCO videotapes **motivate you to read** the Spanish stories?

Very much **A**₁₃ **B**₃ **C**₄ **D** Not at all

7) Do the LESCO videotapes help you **appreciate the cultural information** in the stories?

Very much **A**₁₄ **B**₆ **C** **D** Not at all

8) Does the combined approach to reading (LESCO videotapes and Spanish texts) **make the reading experience more pleasant or more burdensome**?

Much more pleasant **A**₁₁ **B**₈ **C**₁ **D** More burdensome

9) How much **LESCO** could you understand?

100% **A**₁ 80% **B**₁₅ 50% **C**₂ less than 50% **D**₂

10) Did the Spanish captions help you understand the signs?

Very much **A**₁₀ **B**₇ **C**₁ **D**₂ (not at all)

11) Would you recommend the use of this approach for other foreign language courses?

Strongly **A**₁₆ **B**₃ **C**₁ **D** Not at all.