ABSTRACT: This paper illustrates how a computer-assisted interactive video system can be designed to improve the listening comprehension skill in foreign language teaching. The courseware makes use of a wide selection of HELP OPTIONS as informational feedback to assist the learner’s mastery of authentic natural Korean. These options have been designed to maximize student control while accommodating diverse needs and language learning strategies.

KEYWORDS: authoring system, branching, courseware design, HELP OPTIONS, informational feedback, keywords, lesson video, slow audio, template, tutorial

Introduction

The Korean interactive videodisc project has been a joint effort under a cooperative agreement between the National Cryptologic School and Brigham Young University. In this paper I will describe the major courseware design features and the principle pedagogical considerations underlying this developmental effort. My primary objective has been to address our need for a colloquial Korean course, specifically tasked to enhance the listening comprehension skill to a minimum of level 3 proficiency in the Foreign Service Institute (FSI) scale of one to five, and to reinforce the mastery of the basic structure, syntax, and vocabulary of the Korean language in the context of natural discourse. Through computer-controlled video lessons, students are given an opportunity to interact with a system that presents an authentic segment of language and culture through the communication of native speakers in real-world situations. This approach is highly advantageous, since it provides an environment that is close to total immersion. The video enhances language training by presenting both situational and contextual dimensions of discourse such as interpersonal relationships, sociocultural aspects, and the interplay of other linguistic and extralinguistic factors.
Course and Lesson Design

The course is based on two and a half hours of video selections from several TV drama series produced by the Korean Broadcasting Station (KBS) in Seoul, Korea. They have been developed into 51 lessons and a set of proficiency tests. (Refer to the courseware design figure 1.) This courseware branches into two main options: 1) the test mode, in which the student can opt to take one or more performance evaluation tests at the disc level, and 2) the lesson mode.
Each lesson, in turn, branches into two major tracks: 1) the tutorial and 2) exercises, both of which are based on the lesson video, that is usually two to three minutes in length. (Refer to the lesson design Figure 2)

**Tutorial Design**

The tutorial track essentially involves watching the video lesson by lesson while accessing one or more HELP OPTIONS as the need arises. An extensive
Figure 3: Tutorial design: HELP OPTIONS

set of HELP OPTIONS has been designed to serve as the heart of the entire courseware to assist the learner in understanding native-level authentic speech. These options have been designed to allow for maximum student control and flexibility to accommodate adult learners with different language aptitudes, training backgrounds, and preferred language learning strategies, while encouraging repeated access to the video and audio. (Refer to the tutorial design figure 3.)
HELP OPTIONS
relevant video segment
relevant slow/normal audio
with/without keywords
with/without transcript
relevant transcript
with/without slow/normal audio
relevant translation
with/without slow/normal audio
vocabulary notes
cultural notes
grammar notes
hints and clues
content explanation

Constraints have been placed on which of the HELP OPTIONS are made available at different levels in a lesson, based on pedagogical considerations. For instance, the option to see the keywords displayed with the audio is not available until the student has listened to the normal or slow audio first. The transcript option, in turn, is not made available until the student has first seen the keywords while listening to the audio. Since the main objective here is to improve the student’s listening comprehension skill, the transcript and translation options have been reserved until after the student has initially made an effort to listen to the audio, while possibly obtaining some help from the keywords and keyword notes. In other words, a partial transcript precedes its complete version, again requiring more practice with the video and/or audio, so that maximum advantage can be taken of this medium of instruction. At the final stage, however, when students have demonstrated the need for more in-depth HELP than has been so far provided, they can read the transcript or translation while listening to the normal or slow speed audio. It is also from the transcript that notes on the vocabulary, grammar, and culture can be accessed. Once each HELP OPTION becomes available, it can be accessed any number of times in any order. Herein lies the strength of the courseware as an individual and self-paced tutorial that is sensitive to different needs and learning styles.

The exercise track, on the other hand, consists of lesson activities and feedback, based on the answer judging and error diagnosis capabilities of the computer. Informational feedback is given for all responses, both correct and incorrect. This kind of feedback basically provides relevant contextual information pertaining to an exercise item while not revealing the correct
answer, and at the same time makes available a wide selection of HELP OPTIONS to assist student comprehension at the proper level. The students are expected to eventually arrive at the correct answer themselves by accessing whatever HELP they need. Even when a student has selected the correct response, it is pedagogically effective to show why the answer is correct. I have therefore made all of the HELP OPTIONS available as feedback even for correct answers. In order to encourage the student's recourse to the video and audio above and beyond any other HELP, they are usually the only ones to be provided initially. The lessons have been designed to be a tutorial and not a test. In our prototype courseware, we provided HELP OPTIONS through a menu. We have since then modified them so that they are made available through function keys in order to facilitate their access from any point in an activity without repeated reference to the menu. Some typical exercises consist of the following types:

LESSON ACTIVITIES
- Gisting: Identify the topic of a discourse
- Scrambling: reordering sentence fragments
- Identifying the correct transcript
- Cloze Exercises (filling in missing information)
- Vocabulary Building
- Listening Comprehension
- Translation Exercises (information identification)

As a sample lesson activity, I will illustrate how the listening comprehension exercise interacts with its feedback options. (Refer to the listening comprehension exercise design figure 4.) The questions are based on the contents of the video and can be presented in either English or Korean. This flowchart shows that for those questions with four or more choices for an answer, each try would have the following review options in addition to the immediate feedback.

FEEDBACK FOR THE LISTENING COMPREHENSION EXERCISE
1. First try wrong
   review options:
   a. Review the relevant video segment
   b. Listen to the normal or slow speed audio
   c. Return to the problem to try again
2. Second try wrong review options:
   a. Review the relevant video segment
   b. Listen to the normal or slow speed audio
c. Listen to the normal or slow speed audio with the keywords displayed
d. Read the keyword notes
e. Return to the problem to try again

3. Third try wrong review options:
   a. Review the relevant video segment
   b. Listen to the normal or slow speed audio
   c. Listen to the normal or slow speed audio with the keywords displayed
   d. Read the keyword notes
   e. Read the transcript while listening to the normal or slow speed audio
   f. Refer to the grammar notes
g. Refer to the vocabulary notes
   h. Refer to the cultural notes
   i. Return to the problem to try again

4. Fourth try wrong review options:
   a. Review the relevant video segment
   b. Listen to the normal or slow speed audio
   c. Listen to the normal or slow speed audio with the keywords displayed
   d. Read the keyword notes
   e. Read the transcript while listening to the normal or slow speed audio
   f. Refer to the grammar notes
g. Refer to the vocabulary notes
   h. Refer to the cultural notes
   i. Refer to the translation
   j. Refer to the content explanation
   k. Return to the problem to try again

Notice that HELP OPTIONS are provided in increasing number, detail, and variety as the number of student trials increases. This principle of giving HELP in varying amounts proportionate to student effort and difficulty underlies all of the exercises. Once they are made available, they can be selected in any order any number of times. After the completion of a problem, there is always the option to quit the exercise, to EXIT the program, or to go to the TUTORIAL TRACK for further guided study. The main pedagogical consideration here was the balance between computer assistance and student practice and effort. The foremost concern was to gear the design details to meet the training objectives. The same options may be presented in any imaginative
way, depending on the need.

Summary of the Development Procedure

Finally, I will summarize the different stages in the developmental process. I will explain them in terms of three major phases: 1) preparatory, 2) design and developmental, and 3) programming.

1. The Preparatory Stage

The first step in this phase was conducting a curricular needs assessment through the analyses of our training objectives, tasks, and criteria for the project. Relevant course material documentations were gathered and reviewed. Once we identified the course we needed to develop, we obtained studio quality video footage from KBS, and requested its release for videodisc production. The next step was videotape editing, which essentially involved identifying precise segments of the tape for use in the courseware in terms of frame numbers. The content of the tapes transcribed for recording and lesson development. Native speakers then recorded a more clearly enunciated version of the video, normally referred to simply as the slow audio. This version of the audio was originally played on the instavox, but has now been recorded on the second track of the videodisc. The videodiscs were pressed at 3M.

2. The Design and Developmental Stage

There are three major design considerations: 1) courseware, 2) lesson, and 3) activities within a lesson and their feedback. The courseware design is primarily based on the entire course objectives and major branching options. For colloquial Korean, the two major options are 1) the lesson mode and 2) the test mode. The lesson mode may be conducted in either of the two modes: 1) the tutorial or 2) exercises. This approach enables the students to view the video and understand it without having to engage in problem solving all the time. The design of the tutorial and the exercises includes the interaction of the lesson video with the HELP OPTIONS and feedback for student response. Once the kinds of different activities have been determined, the course and lesson designs can be finalized as templates in flowchart forms to show all possible branching capabilities and interactions. An accurate flowchart is the best medium of communication between the courseware designer/subject matter expert (SME) and the programmer.
For each of the exercises within a lesson, the SME must develop a set of work problems or questions, a correct response file containing all of the correct answers, and a distractor file containing all of the incorrect answers. For each of the problems and questions, the correct response, distractors, feedback, branching, and HELP OPTIONS, must be specified for every anticipated student input. These are all formatted in screen display sheets for programming.

3. The Programming Stage

Programming can begin once the templates have been finalized and an authoring system has been selected. The Courseware Design System (CDS) was used for authoring the major part of this Korean courseware. The final stage includes the following four steps:

- PROGRAMMING
- REVIEW
- DEBUG
- EVALUATION

Future Direction

From a designer's perspective, the author's current research objectives are 1) to determine the ideal balance between student control and computer control; 2) to explore various pedagogically effective branching capabilities; 3) to ultimately develop an intelligent and sophisticated system that can accurately diagnose student errors, sensitively monitor student performance and progress, provide appropriate HELP and guidance throughout the instructional program, and finally 4) to measure as well as record the students' problems, difficulties, and efforts, so that better insight may be obtained for understanding the nature of these difficulties and errors and for improving the courseware.

Author's Biodata

Wha-Chun Mal7y Kim majored in theoretical linguistics, specializing in Korean and Japanese syntax within the framework of Chomsky and Halle's transformational generative grammar. She received her Ph.D, from MIT in 1976 upon completion of a dissertation entitled "The Theory of Anaphora in Korean Syntax." She has taught both Korean and Japanese languages and linguistics at the University of Hawaii, the University of Maryland, George Washington University, and Johns Hopkins University. She has been engaged in language teaching, research, and course development at the National Cryptologic School since 1980. One of her major contributions is the "Basic Korean Refresher"
Maintenance Course." She has also been involved in CAI research efforts since 1984, which led to her current work in developing the "Advanced Colloquial Korean Course" by applying the computer-assisted interactive video technology.

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