# Designing a Multimedia Feedback Tool for the Development of Oral Skills

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## Abstract

Effective feedback for students in oral skills classes is crucial to successful language instruction. Written comments and individual consultations are common means of feedback; both are time-consuming, however, and often not as effective as we expect. *Language Evaluator*, a multimedia feedback tool developed by the University of Washington's Technical Japanese Program, allows instructors to provide written and oral comments on students' videotaped performance and to link those comments to corresponding portions of the video. *Language Evaluator* has been tested and has proved effective for oral skills training.

## 1. Introduction

Providing students with effective feedback on their oral performance is one of the major challenges in language instruction. It is particularly difficult when a discourse is long (e.g., presentations, discussions, or long conversations), when the use of grammar, vocabulary, etc. is no longer controlled, or when students' errors and other speech problems are diverse, as is often the case with oral activities in upper-level classes. One common practice is to provide oral or written comments on students' performance after an activity is completed to avoid interrupting the student and thereby inhibiting his/her performance. However, this approach is not without its drawbacks: during an activity, it is difficult for a teacher both to catch and to record all of the performer's errors/problems while concentrating on all aspects of the activity; additionally, students may not be able to connect the given comments to problems in their performance either because they cannot remember certain aspects of their performance afterwards or because they are not aware that they had made a given error.

Recently, the emergence of video, computer, and multimedia technologies and the increasing affordability of such technologies has provided language teachers with the potential for developing greatly improved feedback tools. In what follows, we look at the merits of video as a feedback tool for oral performance (Section 2), discuss design considerations in developing a useful multimedia feedback tool, and introduce *Language Evaluator*, a program under development at the University of Washington's Technical Japanese Program (Section 3). Finally, we discuss our findings from the use of *Language Evaluator* for two quarters in Technical Japanese classes (Section 4) and make some concluding remarks (Section 5).

## 2. Video as a Feedback Tool

Video is widely recognized as a highly effective means for language learning when it is used to review students' oral performance (e.g., Garrison (1984); Broady and Le Duc (1995)). In

addition to motivating students to perform well, there are a number of merits to using video for student feedback.

a) When students review their own performance from a third-person's viewpoint, they can see their strengths and weaknesses more objectively than when they receive feedback solely from their teachers or when they self-monitor during a performance. For a student to see his/her weaknesses objectively is an important step toward improvement.

b) Because video allows for pausing and replaying a performance at any point, students and instructors can review the performance more thoroughly/accurately.

c) Because students can review their own performance alone, it is less intimidating and possibly less embarrassing than receiving feedback from peers or instructors in class.

d) Feedback using video is "delayed feedback" by nature. That is, when a student's performance is being videotaped, the instructor does not have to interrupt the performance to correct errors on the spot. Thus, students can keep focusing on the assigned task and do not have to be discouraged by corrective feedback when they are producing sentences. The instructor, too, can focus on leading the activity without thinking of whether to correct a given error, how to correct it, etc.

e) The instructor does not need to spend class time correcting students' idiosyncratic errors and can give each student a more complete and effective diagnosis of his/her performance using the video.

f) If student performances are videotaped at different points in the course, instructors and students can see the student's progress in the most objective fashion. That is, video can be a powerful evaluation as well as feedback tool.

Recognizing the merits of video mentioned above, the Technical Japanese Program has employed it routinely for reviewing students' oral performance. However, we found that the conventional use of video (i.e., videotaping students' performance for playback later) was not serving our needs in the way we wanted. The entire process was not only time-consuming, the written feedback itself was sometimes ineffective. Moreover, the traditional feedback sheets gave students little chance to discover errors in their performance on their own. In order to improve our system and to make the best use of video technology as a feedback tool, we developed a system we call *Language Evaluator*, an oral performance feedback program which integrates multimedia technology.

### 3. Designing *Language Evaluator*—a Multimedia Feedback Tool

3.1 *Functionality Requirements*

In designing a multimedia program which can be used to provide effective feedback on oral performance, we aimed first at fulfilling the following functionality requirements.

(1) The program must allow instructors to make comments on specific parts of students' performance and on the overall performance without any restrictions in terms of writing space, format, and character set. There are many ways of designing comment space, but at this point we feel it is better for our needs to make the space generic rather than to define comment fields (e.g., fields for errors, correct forms, error categories, etc.) This way the comment space can accept almost any kind of comment and the tool can be used for activities other than foreign language instruction.

(2) The program must allow instructors to link comments to the corresponding video segments so that students can see the comments and the video segment together. As mentioned earlier, a linking capability is especially important for long activities. Digital media and computer technologies make this possible.

(3) The program must allow individual instructors to define a set of comment categories (e.g., pronunciation, vocabulary, grammar, non-verbal, etc.) since the necessary set of comment categories will differ from class to class and instructor to instructor. Including comment categories is useful for students and for instructors. For example, the categories are helpful in guiding students to discover their errors on their own. Categorizing errors is also useful in gathering error statistics.

 (4) The program must allow instructors to provide correct forms and/or comments in voice form if necessary. This function is important when a written comment alone cannot make the point clear.

(5) The program must be able to guide students in finding their errors/problems in a step-by-step fashion (e.g., first, letting them know that there is an error in a certain segment; second, telling them exactly where the error is; third, telling them what kind of error it is; and finally, telling them what the error is). This function makes the feedback tool critically different from the conventional combination of video playback and written comments, an approach which denies students the chance to discover their errors on their own.

(6) The program must allow students to practice correct forms, record them, and give them to the instructor or compare them with a model if provided. It is always best if students can practice correct forms right after they find their errors and having a recording function makes this practice more effective.

(7) The program must allow teachers and students to print out comments for future use. Hardcopies of feedback comments are helpful to students for later review at home. They are also useful to teachers in reviewing students' performance when computers are not available.

(8) The video and comment files must be secure so that they are free from intentional or accidental erasure or alteration. There are different levels of security that must be considered when we use computers for instruction. The protection of video and comment files is one of the most essential security requirements.

(9) Operating the program must be intuitive and easy. Making comments is a time-consuming task for instructors; therefore, the tool interface must be designed to achieve the highest level of usability. For students, the learner's interface must be user-friendly and must avoid any element which may discourage the use of the tool.

## 3.2  *Language Evaluator*

*Language Evaluator* is the outcome of our effort to develop a multimedia feedback tool which meets the functionality requirements discussed above.  Here we look at how this program works; first, an overview of the process, followed by descriptions of the two components: *LE Author* and *LE Learner's Interface.*

### 3.2.1 Overview

Figure 1 shows the general process for this program.  First, students' oral performance is videotaped.  The video clip is then captured in a computer (i.e., digitization) and compressed to create a movie file of reasonable size. While viewing the oral performance on the authoring tool (i.e., *LE Author*), the instructor makes written and/or voice comments on the performance. *LE Author* creates written and voice comment files from the instructor's comments (3.3 below).  Those files and the movie file become the input files to *LE Learner's Interface* where the student views his/her performance and the instructor's comments. Students can practice correct forms and record them using the program's recording function. They can save those voice files and send them to the instructor for review if required.
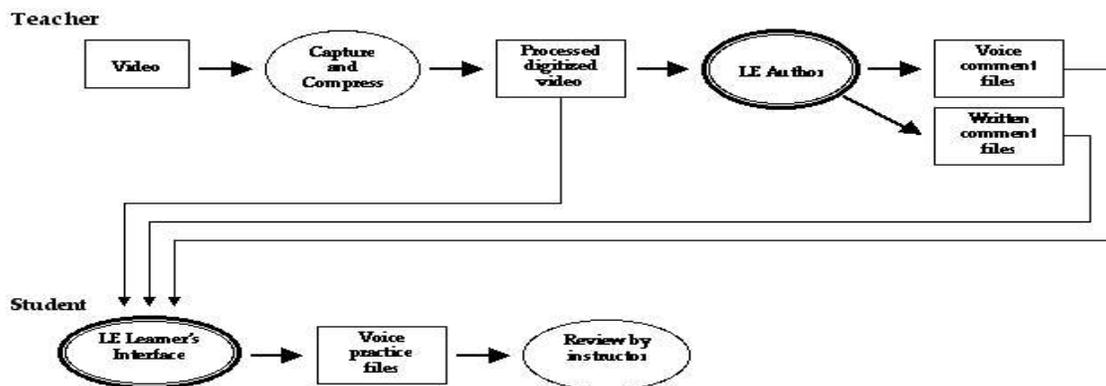


Figure 1. *Language Evaluator* Overview

### 3.2.2  *LE Author*

*LE Author* is the comments tool for *Language Evaluator*.  After launching *LE Author*, the instructor selects the video file to review by clicking the video window.  The video is operated with buttons at the bottom of the video window (Figure 2).  When the instructor determines that a video segment requires comment, s/he sets the beginning and end points of the segment by clicking the respective Start and End Set buttons, checks an appropriate error category (or categories), and writes comments (usually, an error form, the correct form, and a brief explanation if necessary) in the comment box.  The comment box is a free space like a notepad, so it can be used in whatever way the instructor chooses.  (If necessary, a different category set can be defined by creating a category file beforehand.)  Clicking the Record
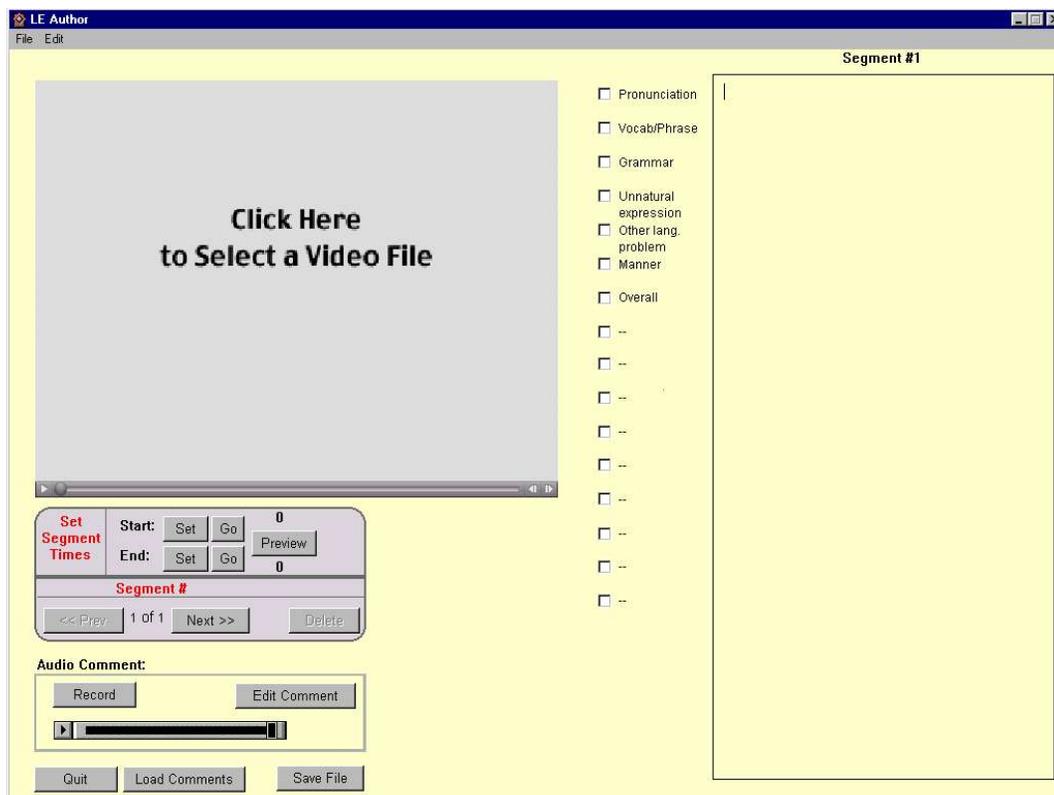
button activates the recording function. With this function the instructor can make a voice comment in addition to written comments. When the segment is completed, the instructor clicks the Next Segment button. Then, the instructor continues the process with the next segment. After the instructor finishes commenting on all the segments, s/he saves the written comment file, which will be used as an input file for *LE Learner's Interface*.

Figure 2. *LE Author*

### 3.2.3  *LE Learner's Interface*

*LE Learner's Interface* is the student tool for *Language Evaluator*. After launching *LE Learner's Interface*, students can review their oral performance by selecting the desired written comment file created by the instructor in the open dialog that appears. This operation opens the video file with its corresponding comment files (Figure 3). Students can review either their entire performance (by clicking the Play All button) or their performance segment by segment (by clicking the Segment No. button). When reviewing segments, students can first choose to see no instructor feedback at all or choose only the error categories. By looking at the error categories they can focus on certain aspects of their performance. The process of reviewing segments without reading instructor comments first is expected to help heighten the student's level of awareness of his/her problems. This is an essential step in successful language learning.

When the audio comment indicator is checked, students can simply click the Audio play button to listen to it. They can also use the built-in recording function to practice the correct

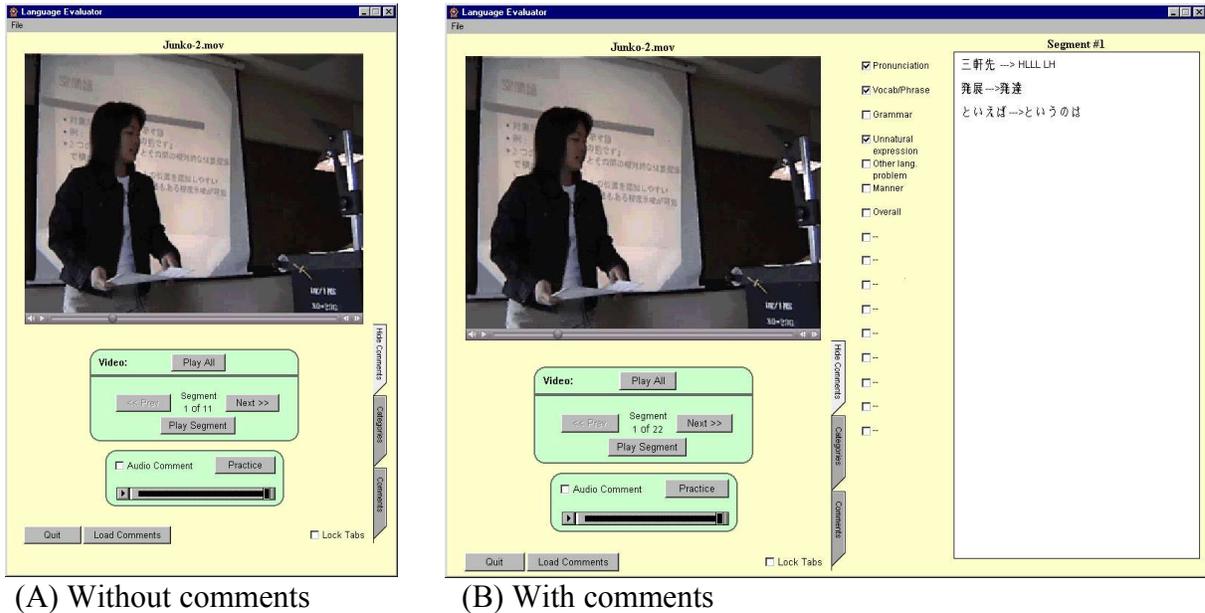forms, recording their voices for self-check and/or saving the voice files for their instructor's review.



(A) Without comments  (B) With comments

Figure 3. *LE Learner's Interface*

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For security purposes, *LE Author* and *LE Learner's Interface* are designed as separate programs. Students can access comment files with *LE Learner's Interface* but this program does not allow them to delete files or alter a file's content. They cannot access *LE Author* directly.

## 4. Findings

We used *Language Evaluator* for our upper-level Japanese classes in Winter and Spring Quarters 2001. In those classes we assigned several oral presentations, videotaped students' performances (approximately 10 minutes each), and reviewed the presentations using *LE*. Here we discuss our findings from this experience with *LE*.

Previous to Winter 2001, we had given the same assignments and had reviewed students' presentations using the conventional playback method with written comment sheets. As mentioned earlier, this system was not as effective as we had expected. We found that (1) the cumbersome and slow playback operations discouraged students from reviewing their performances thoroughly; (2) often students couldn't connect our comments to the corresponding parts of their presentations; (3) sometimes students couldn't correct pronunciation errors from written comments; and (4) students didn't have chances to discover their errors on their own.

Although the *LE* system after two quarters did not make our students perfect speakers of Japanese, it definitely helped to eliminate the problems mentioned above, especially numbers

(1), (2), and (3). In fact, our students reacted very positively and most showed marked improvement in terms of habitual pronunciation and grammar errors. Additionally, even though students were not fully successful in eliminating some of their problems, their awareness level of those problems increased. This became apparent when we asked them in the second quarter to self-review their performance before we gave them *LE* feedback. Most students detected more than 50% of their errors.

From the instructor's point of view, *LE* was extremely useful. It improved the feedback process significantly and helped to make our feedback more effective. Previously we had had to watch students' performance on a playback (often playing back and forth to view some segments repeatedly) while taking notes, and based on those notes, had to enter comments into the computer to create comment sheets. With *LE* these steps became one. In addition, because of the easy digitized video operation (e.g., instant rewind/fast-forward, fine positioning), we could review students' performance more accurately. Moreover, because feedback records (i.e., video files and our comments) were readily accessible for both quarters, evaluating each individual's progress over a period of time was relatively straightforward. It was also apparent that the error statistics *LE* was gathering would be a valuable resource for research.

Although we found the current version of *LE* very useful, after two quarters we have determined there are several areas which can be improved. For example, the current version of *LE* works well for individual review, but it is not as effective in the classroom. We are considering a function which will allow us to gather common problems from different students' performances and present them as a set or, more generally, a function that allows us to edit comments on different performances into a new set of comments linked to corresponding video segments.

Another issue is that *LE* requires a long video-compression process. For example, it takes several hours to process a 10-minute presentation on a Macintosh G3 computer. Because of this, we made it a practice to process videotaped presentations overnight. The processing speed depends on the computer, mass storage, video content, processing software, compression settings, etc. This processing problem will be alleviated when powerful computers become more affordable.

Additionally, securing the storage needed for movie files (both pre-processed files and processed files) is a problem at this time. Although pre-processed files do not have to stay in the disk storage after they are processed, they need a very large disk space (e.g., a 10-minute presentation is about 2 GB). Processed files are usually much smaller than pre-processed files, but if we want to keep them in the resident storage, a server with a large amount of disk space will be necessary. If there is no such space available, files can be archived to removable media such as CD-ROMs. Voice files are small (2-3 KB for a 10-second segment), but if we create many, they add up to a few hundred or more KB. Here again, this problem will be easier to solve as hard drives become increasingly larger and cheaper.

## 5. Conclusion

Our work with *Language Evaluator* in our Technical Japanese classes has convinced us of the power of multimedia technology for creating an effective language feedback tool.

With *LE*, students benefit individually from feedback that is accurate, convincing, non-intimidating, and convenient.  Instructors are able to use class time more effectively and can focus fully on evaluating students' performance thoroughly and more objectively at a later time.  Although the evaluation process is still time-consuming, we found it to be more efficient and more rewarding than conventional feedback practices.

In addition to its value for language education, we feel this concept can be applied to a variety of performance areas (e.g., language arts, fine arts) where feedback and evaluation are essential.

**References**

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