Abstract: The purpose of this article is to present recent improvements in interactive videodisc (IVD) lesson development at the United States Air Force Academy (USAFA), discuss the rationale for our latest lesson design—its advantages and limitations—and discuss the rationale for IVD use at USAFA. For more than a decade, the Department of Foreign Languages (DFF) at USAFA has been seeking ways to integrate IVD technology into the foreign language classroom. After experimenting with cumbersome interactive videodisc videotape, DFF has since developed three interactive videodisc lesson designs for all seven languages taught at the Academy. The third and latest lesson design differs from the previous two in that it uses only the target language coupled with additional images and audio to mediate meaning, rather than rely on English text translations and glossaries.

LESSON DESIGN #1

DFF’s first template was designed to use English translations and glossaries to mediate meaning, since this was the only way to use the design in more than one language. Experimental as well as functional, this design was created to see how
well the software would interface with the hardware and provide meaningful interactive exercises to benefit the students. Content or course material is stored in a file server, separated from the structure—not grammar, but the program or lesson design. When the lesson content is called up at an individual’s workstation through the computer network, it is combined with the lesson structure at the workstation to provide a course specific lesson.

This lesson design consists of four basic options for the student to select with the mouse: Overview, Manipulation, Exercises, and a Mastery Check. When the student selects a lesson, these four options are immediately available as choices. Ideally, the student selects the Overview first to view the complete scene at least once. Then, if the student has comprehension problems, he can select Manipulation to hear the same scene broken down sentence by sentence, or by phrases. Several buttons appear along the bottom of the screen which the student may select for additional information: BACK goes back one utterance, PLAY plays the scene, CONT continues to the next utterance, AUD/TXT replays the scene and prints the target language script across the top of the screen, TRANS provides an ENGLISH translation for the entire utterance, GLOSS provides an English translation for each word in the utterance, and EXIT returns the student to the display to choose from the basic four options again.

Four types of exercises are available for student practice after completing the "Overview" and "Manipulation" functions: "Guess Meaning," "Scrambled Sentences," "Scrambled Words," and "Scrambled Letters." "Guess Meaning" provides the student with a choice of three English translations, although target language paraphrasing could also be used. "Scrambled Sentences" takes up to eight dialog utterances and puts them in a random order for the student to reconstruct the dialog one line at a time. "Scrambled Words" does the same with words in each sentence, and "Scrambled Letters" mixes the letters of individual words. No "Mastery Check" was ever developed.

This original lesson design is limited to using the videodisc only in a linear mode. No other part of the disc is available for viewing until the student exits a lesson and selects another. If a student does not understand something, his only recourse is to use the English translation or glossary.

**LESSON DESIGN #2**

Our second template was designed following a similar format to save hundreds of man-hours in programming costs, but with certain
modifications. The Overview will play selected segments, which are not necessarily a complete scene. It also includes a list of desired objectives for a particular lesson. "Manipulation," renamed "Practice," keeps many of the same buttons as the original template, but eliminates the translation function. It also adds a fast forward and fast reverse capability. "Exercises," renamed "Discrete Diagnostics," also uses the same basic exercises as the original.

The major difference in this template is the addition of a timed mastery check, called "Global Comprehension," to monitor student progress. This includes several types of multiple choice questions, such as logical rejoinders and paraphrases, in the target language. The final part of this section is a cloze test where students must select the correct word to fill in the blank based on the context.

LESSON DESIGN #3

Our latest template combines many elements from the original and the second design, and two new concepts. For instance, this template is designed to use only the target language in the "Practice" segments for clarification and remediation. No English text is available for glossaries or translations; it uses video, audio, graphics and target language text to mediate meaning. Instead of TRANS and GLOSS buttons at the bottom of the screen, this template has a HELP button which enables the student to select other video and audio examples from the disc, with occasional text or graphics files from the computer, to provide clarification. This design also addresses different language proficiency levels, by using more difficult examples first, as a help to all students, then continuing with less complex examples to the easiest example last for those students needing all the HELP available. The
other functions are basically the same as for the second lesson design.

**WHAT IS SO DIFFERENT ABOUT OUR LATEST LESSON DESIGN?**

Most significantly, this design allows us to use certain videodiscs more efficiently: we can access any part of a videodisc to provide similar scenes as examples to mediate meaning, giving students more options for HELP. These segments may be used alone or be combined with a text overlay which prints either the script in the target language for what is being said, a paraphrase of what is said, or a description of an object in the scene, across the screen. In addition to using these text files to simply describe an item, we can create graphics overlays or animations—from something as simple as an arrow pointing to the object being described or a cartoon showing the same object in a different background, to a computerized cartoon animation—to clarify an action or concept. In short, we can provide as much comprehensible input in the target language as is practical for an individual's ability level.

For example, with the latest lesson format, we are able to view a scene from anywhere on the desired disc side, i.e., from 1000-2000 then jump anywhere on the same side, to frames 2999, 12001, 35000 etc...in a fraction of a second to view another similar scene for reinforcement or clarification. Imagine that the student is watching a Frenchman in Paris order dinner at a fine restaurant on video, and he orders *les crevettes*. The student has no idea as to what this is and he won't know until it is served 20 minutes later, if he watches the whole video in a linear fashion. By then, the student may be totally lost because he did not understand this and several other vocabulary words, or concepts critically important to understanding the lesson. The student may lose interest in seeing the rest of the video because of lack of comprehension, become bored with it all, and even fall asleep.

With our latest lesson design, instead of falling asleep, the student can select HELP with the mouse and the computer will jump to another scene on the disc where someone is buying *crevettes* at the market. Next he may jump to a scene where fishermen are unloading their cargo of shrimp. If he still isn't sure of what they are, the next HELP selection will take him into the restaurant kitchen where the chef is preparing the dish. Next, he may jump to the scene where the person is eating *crevettes*. He may jump several thousand frames several times in a matter of seconds, instead of using several minutes
looking up the words in a dictionary or just using English translations provided by the computer. Any part of that videodisc's 54,000 frames are within a second reach for use to provide multiple examples in the target language. After seeing and hearing these examples, the student should understand, and he hasn't heard or seen a word of English.

This design is essential for efficient use of certain videodiscs—for instance, if a disc contains a storyline for the first half of a side, and the second half contains a pedagogical section with numerous examples for reinforcement and clarification. Accessing these examples any time a student does not understand a vocabulary word or a concept being discussed may be extremely helpful, if not absolutely necessary, to understanding the whole scene. A student may need immediate help for comprehension while viewing a scene. He may not understand the next phrase if left in the dark for several minutes, until the video arrives at several clarification examples, concerning a problem that is now forgotten. With the new lesson design, the slower student can go IMMEDIATELY to these examples and see all that are available for HELP, and the faster student can see one or two and exit the HELP function to continue the lesson.

LIMITATIONS AND POSSIBLE SOLUTIONS

Although interactive videodisc technology is constantly improving, it is still not without limitations or disadvantages. Due to possible oversights during video production and technology limitations, there are difficulties in "repurposing video" (accessing existing video scenes in a different manner than in the original, linear format, and adding access to other materials for remediation). There is also the continual problem of deciding what type of
comprehension problems students at different levels in the language will have while viewing the same lesson segment. We must choose examples for clarification adequate in number and type to further the language acquisition process for each student.

The first problem of oversights during production would, of course, be most easily solved during the creating and editing phases of video production. This being the case, we should have a definite plan in mind for how to use the videodisc being viewed before selecting it for our course. This could save hours of work trying to change something written in stone just to fit our course needs.

One example of a production problem which does not necessarily detract from a video used solely in a linear mode, but can make comprehension difficult when a programmer divides the video into smaller segments, is "utterance overlap." For example, the person speaking is not the person being viewed, or the scene has not changed and that person has started talking about the next scene. As an extreme example, it can be confusing to the student to listen to someone describe a red Porsche when what he is viewing is a yellow Volkswagen for five seconds, before the scene changes to the Porsche.

We have general options available to work around this problem. One option is to change our plan and lengthen the segment to include both card, instead of describing just the red Porsche. Or, if there are other examples on another part of the disc, with this lesson design, it is relatively simple to pull in those frames for our lesson. If not, we can use a graphics and/or text file overlay an no audio to describe the yellow car for clarification.
Another current problem is that we are limited to what is on one side of the disc, 54,000 frames, or 30 minutes of full-motion video, for use. If our lesson segment is on side A and we need to use numerous examples on side B, we are out of luck. Here again, we can use a graphics, text, or animation file overlay, with or without audio. With the use of CD-ROM technology in the future, we will see fewer such limitations. CD-ROM will be part of our move to a multimedia environment using this technology for dictionaries, grammatical explanations, additional audio, full-motion video, and still frames for clarification and reinforcement examples. Also, be relegating video clarification examples to an overlay that only covers a small fraction of the screen, CD-ROM will allow the viewer to see both the lesson segment and the example at the same time, which should help the viewer understand what is being said or inferred.

A third problem is not as easily solved: we must predict the problems and questions students will have with each lesson segment so we can provide meaningful clarification examples, adequate in number and type, for each student’s level. Not only must we provide an adequate number of examples to avoid losing the slower student and causing chronic boredom, we must offer the faster student the opportunity to avoid the same fate due to viewing too many examples that are not needed for his level of comprehension. Making HELP applicable to the individual’s level of expertise is due, at least in part, to a study (Marlino, 1989), where many of the faster students skipped all HELP available and went directly to the exercises and finished early, while the slower students explored every possible HELP available. The faster student must be able to skip some or all help, to avoid becoming bored and demotivated, so he can exit when he understands, and continue on to the next scene or lesson.

Even though we may encounter these and other limitations with IVD technology, we can work around them with a suitable lesson design such as our latest, which provides several advantages that we want to summarize.

**ADVANTAGES**

**Efficiency.** Probably the greatest advantage to our latest design is that we can make full, efficient use of the complete videodisc. Whenever we choose a certain segment which reinforces or further clarifies the lesson subject matter, we can include it with just a few minutes work on the computer.

**Timeliness.** The student has instant access to HELP and does not have to
wait until the video arrives at a certain segment 20 minutes later to get the necessary clarification for a problem that is no longer uppermost in his mind. Timely clarification of terminology or concepts is probably just as important as having the right kind and number of examples, since it forces the student to engage his mind and interact with the video. He will not shut down the acquisition process simply because he does not understand a word or concept and becomes bored.

Accessibility. Another major advantage is that this lesson design can use examples from other sources, such as graphics, animated characters, and text overlays—singularly or combined—to provide examples. This is especially beneficial when a videodisc is designed primarily for use in linear fashion, and has no other examples that can be pulled in for clarification.

Clarification in the target language. English is not a necessity for mediating meaning with good, comprehensible input available through several sources.

**WHY INERACTIVE VIDEO?**

Although evidence from USAFA studies conducted to date only suggest that students using IVD may outperform other groups, there may be other good reasons for using IVD technology in the foreign language laboratory, in conjunction with classroom work. Motivation through attractive visual cues, opportunity to hear the target language used by many native speakers in everyday scenarios, and perhaps the most important, the opportunity for self-paced instruction, may be just a few of the advantages over traditional classroom and language laboratory experiences.

In the classroom we usually find students from diverse backgrounds who are at different levels on the road to acquiring a second language. In a medium-level first-year university language course, we may find several students who have had a year’s exposure to the language in high school, others two year’s, and perhaps a third segment of the group...
have had three or more year's exposure. Then, there might be some who have had several year's experience, but have not used the language for a lengthy period of time. How do we give each student adequate comprehensible input (i+1) in a typical classroom situation for that individual's experience level?

Even if we give a placement exam to limit the range between the highest and the lowest student's expertise level, we still are going to have a certain amount of disparity in the amount of language each student has acquired, and in the amount and type of examples each student needs to acquire more. So where does the instructor aim the bulk of the lesson material—instructions, examples, and activities? At the average student? If so, we end up with bored students at the top of the class because they already know how to say "I ate breakfast at 7:30 today" and they lost interest after the second example. The instructor may have time to give six examples which may be sufficient for average students, and the slowest group is still struggling and could use another six examples for clarification. When are an individual's needs met?

With IVD technology, this problem can be alleviated by offering students the opportunity to view and review a video scene, any pertaining examples for clarification, and any exercises, as many times as that student needs, in a low threat environment. Then, an assessment tool can be applied to determine if that individual needs more work. The instructor can provide as many examples as deemed necessary for that particular lesson. Students who only need a couple examples to learn a particular lesson, may skip the others and proceed to more difficult lessons. Slower students can view all the examples and if need be, ask the instructor for more help, since the instructor is available. The key idea throughout this process is to "facilitate" language acquisition by providing a broad range of comprehensible materials—text, graphics, animations, and video—geared to every individual's level. We want, in effect, to provide a "smorgasbord" from which students can select and proceed at their own pace.

CONCLUSION

Much research has been accomplished at USAFA in the use of IVD technology as a tool for foreign language education, and is one reason for developing this new lesson format. More research is currently in progress at the Academy, exploring numerous possibilities for IVD use in the classroom, some be our own professors and some by individuals from other institutions. The Department of Foreign Languages at
USAFA has a program whereby individuals may propose to do research projects using its Language Learning Center, and several have taken advantage of it. Much has been accomplished, more still remains to be completed, and much more still to be imagined. If you have a research project you think is worth pursuing, you may want to consider proposing it to DFF. It is only through the cooperative efforts and ideas of many individuals in programs like this, that we are able to achieve workable lesson designs and improve upon them, which will benefit not only the Academy's foreign language program, but foreign language education across the nation.

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