VIDEODISCS AS DATABASES

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ABSTRACT

The special properties of videodiscs, the economics of videodisc production, and the nature of our educational system are put forward as arguments in favor of making cost effective videodiscs by designing and utilizing them as aural and visual databases designed to be utilized at a variety of levels and in a variety of instructional contexts rather than as the basis for highly evolved and specialized lesson designs or as "just another way" of delivering film or videotape.

THE BIOLOGY OF LIVING LANGUAGE: VIDEODISCS AS DATABASES

As has often been noted, a new medium tends for a time to be inappropriately used as just another means for delivering old messages. For example, motion pictures in their infancy were often little more than filmed stage plays and too often the early programs in computer assisted instruction were in effect pages from a textbook or workbook transferred to the small screen. With maturity and evolving techniques and technology, the true potential of a medium emerges.

Our purposes here are to argue that in the context of language instruction it is equally inappropriate to utilize videodiscs on the one hand as "just another way" of delivering motion pictures or full motion video, or on the other hand to produce videodiscs which are designed exclusively for use as an adjunct to highly evolved and specialized computer course materials. It will further be urged that such uses of videodisc technology cannot be cost effective in the context of our educational system, and will therefore result in underutilization of a medium ideally suited to language instruction. Finally, an optimum and cost effective role for this new medium—as a database of natural language which can be easily and instantaneously sampled to provide support and illustration of aspects of language at the appropriate point in any curriculum—will be set forth for consideration.

CHARACTERISTICS OF THE MEDIUM

Variety of Sensory Modalities

Videodiscs are, of course, capable of delivering messages via both sight and sound, and by means of these to suggest the other senses, touch, smell, and taste. This enables discs to provide both verbal and nonverbal messages. Whether or not one accepts the experimental findings of Mehrabian (1972) that approximately 55% of the attitudinal aspect of human communication is based on facial expression, with

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another 38% being based on paralinguistic features, leaving 8% to lexical and grammatical features of communication, this capability would seem of special importance to language pedagogy.

Videodiscs have the potential to provide printed equivalencies of ongoing verbal interactions simultaneously with input from other sensory channels. This technology further has the capability of providing alternative aural texts (such as the target language on one audio channel and the native language of the learner on the other, or simply of different languages or levels of language as "voice over" a visual text, for example). Since any of these sensory channels can be toggled on or off as desired, a very rich range of possible sensory combinations is readily available.

While interconnection with a computer does not add to the number of sensory channels addressable by videodisc alone, the possibilities for simultaneous combinations of these channels can be multiplied through interconnection of these two technologies with special video cards to add such possibilities as textual and graphic overlays; capture and digitization of still frames; and scaling of visual images so that they will fit on a portion of the computer screen, leaving the rest free for text, graphics, or other video displays. The potential for digitized sound is added to the audio capabilities, either via computer generated sound or Compact Disc Audio.

In short, the combinatorial possibilities become immense in number, and it is difficult to think of a pedagogical area more able to benefit from such multisensory richness than language learning.

Extensive and Versatile Data Storage Capacity

To the richness of the types and combinations of data that can be simultaneously displayed lies the sheer storage capacity of the videodisc. A standard 12-inch CAV disc can contain up to 30 minutes of motion video, or 54,000 still frames or pages of text, or a combination of still and motion, plus two or more channels of audio. CLV discs can hold up to one-hour of full motion video. On CAV discs (and with the Pioneer 8000 player, CLV discs as well) individual frames can be isolated and used as still frames. *[Ed. Note: See "Tech Talk" on p.51 for a discussion of CAV vs. CLV videodisc technology.]* Short segments of motion can be identified by their in and out points, stored in memory, and used in any desired sequence as free standing units to illustrate particular pedagogical points.

Interconnection with computers has a highly elaborative effect on the data storage capacity of videodisc technology. To the video and audio on the disc, we can now add visual graphic effects, computer-generated sound, and digitally stored textual materials. The vast storage potential of CD-ROM discs is also accessible via computer interface, and more than one videodisc player or CD-ROM drive can be simultaneously available for access.

Randomly Accessible

All of the sensory data storable on videodisc are randomly and instantaneously accessible via the remote controllers of many videodisc players. Not only can a particular frame or sequence of frames be accessed and played back at a variety of speeds via remote control, but also the desired sensory channels can be selected and changed at will. Again computers can greatly extend and facilitate this capability.

ECONOMIC ASPECTS OF VIDEODISC PRODUCTION

While economies of scale (i.e., the more units that are produced, the lower the cost per unit) are true for all media software, the ratio of fixed to variable costs is probably significantly higher in the case of video discs, due to the expense of producing original materials of high enough quality to take

advantage of the capabilities of the medium, together with the high cost of producing the initial master disc as compared with the very low cost of each subsequent disc. (A similar situation prevails in the case of "check" or "alpha" discs where each copy of the disc has a fixed and rather high price.)

The "take-off point" in media adoption may be defined as that point at which educational institutions conclude that the supply of relevant software justifies the purchase of the requisite hardware. If videodiscs are to be a commercially viable medium—as they must be to reach the "take off point" in instructional settings—each disc must have large numbers of potential buyers in order to amortize the original production costs over the price of any copies sold at an affordable price.

While it is not our purpose to discuss hardware costs per se, nevertheless it is also a reasonable guess that institutions are unlikely to invest in videodisc players unless there is perceived to be an adequate present and future supply of discs directly relevant to the curriculum. Videotape received an initial boost in the supply of software due to self-produced and off-air tapes, which when combined with the slowly growing supply of commercially available materials persuaded schools and colleges that it was indeed time to invest in videocassette recorders. As VCRs became readily available for classroom use, publishers are motivated to produce additional software; thus there may be said to be a point at which the viability of a medium hangs in a delicate balance between software and hardware availability.

The realities of the economics involved would therefore suggest that a videodisc in order to be cost effective must have as wide a potential market as possible, with implications for production and utilization to be considered at a later point in this discussion.

CHARACTERISTICS OF EDUCATIONAL PRACTICE

While there are commonalities and overlaps in the curricula and classroom schedules and practices of our schools and universities, to a large degree the specifics of curricula are locally determined. Within this milieu, textbooks are utilized as guides and ways of providing broad organization to course materials. At the same time, they somewhat alleviate the teachers' burdens by providing ready made exercises and practice activities. Since the cost of textbooks is usually borne by students, either through purchase or rental fees, textbooks, far from imposing an economic burden on educational institutions, actually may save expense in real terms by increasing the productivity of teachers.

Furthermore, there are a variety of textbooks at any level to choose among. While they may represent well thought out and organized approaches to instruction, the fact remains that they are to an extent modular in approach. A teacher may substitute her own exercise for one in the text, and within the constraints of grammatical and lexical continuity may skip exercises, chapters, or sections - or even rearrange the order of presentation.

Beyond this, there are a variety of theories, philosophies, and methodologies utilized in language classrooms in free educational systems. In fact it is not unknown to find within one language department at one institution proponents of different approaches. Further, many teachers deliberately adopt an eclectic approach with the view that students within one class may represent a range of learning styles.

From these circumstances, we may conclude that a videodisc, in order to achieve maximum usefulness in a variety of classrooms, must contain as wide as possible a sampling of those aspects of language around which lessons are most frequently centered, as well as including vocabulary

commonly included in classroom instruction.

As the preceding discussion has attempted to make clear, videodiscs lend themselves extremely well to a multisensory approach, one that is of special value in language learning and teaching, particularly in view of the variety of methodologies found in the classrooms of a "free" educational system.

However, videodiscs, together with the hardware necessary to utilize them, represent a significant outlay of funds for educational institutions. Of equal concern is the cost of producing a high quality videodisc in distributable form. Any disc, however excellent, the use of which must be limited to one curriculum, level, text, or even teaching methodology will have a much smaller potential market, and given the extreme economies of scale, each copy of any commercially viable disc will tend to be too costly for occasional use for motivation or enrichment. It seems unlikely that many institutions in the foreseeable future will toss out texts in honor of video-based curricula, and even if some do, they will probably want to alter any video-based curriculum they might select to fit more closely with their own aims, goals, and methodologies.

Taken together, these conditions argue in favor of what Jonassen (1984) has termed "the generic disc." Excellent examples of generic discs are some of the science discs currently available. These discs contain still frames as well as animated and full motion video sequences of natural processes, laboratory procedures, and the like. Each frame of motion sequences can, of course, be isolated and used as a still frame, and sequences can be shown at various speeds. Some discs contain two sound tracks, for example, Spanish on one track and English on the other, or advanced narration on one versus narration suitable for elementary levels on the other. Other excellent examples of generic discs can be found in the fine arts. Such discs are typically accompanied by hard copy indexes with a frame-by-frame listing of all contents, a listing which is made from the point of view of the "typical" biology curriculum. In other cases, HyperCard stacks provide a more sophisticated and rapid means of accessing materials by topic, subject, or keyword. At least one publisher indexes the videodiscs as they correspond with chapters or sections of its various biology texts.

Beyond this point, it is typically left to individual teachers or institutions to utilize the discs in whatever way best suits their special purposes. In this way, one disc can be extremely useful all the way from elementary school through college. Such discs may truly be termed visual and aural data bases. Since so much material can be included on one disc, and the disc can be used in a variety of hardware and user configurations, the result is an extremely versatile product which can be kept in a library or resource center and made available to all members of the instructional staff as needed. Above all, though expensive to produce initially, it is a product with at least the hope of being economically viable.

How does this apply to language teaching? One possible example would be a disc containing brief situational encounters in the target language which could be carefully designed and indexed for domain (vocabulary used), language function (e.g., greeting, apologizing, explaining, etc.), level of participants (equal or unequal status), level of formality, vocabulary domain, grammar forms effectively illustrated, and the like. Other features might be mini-documentaries which include voiceovers in the target language at different levels of difficulty. At appropriate points in the lesson, text in the form of subtitles can be added to the presentation. Computer software which indexes the contents in every

possible relevant way can add immeasurably to the usefulness of a generic disc.

In addition, individual CAI lessons could be tailor-made rather easily on a local basis by using such simple-to-master software as Voyager/HyperCard for the Macintosh, or LaserLink/Linkway for DOS systems, either to accompany specific texts or to fill special slots in the local curriculum. In short, the possibilities are almost endless for use of a series of well-made and well-planned disc at various levels, in various hardware and learner configurations, in support of divergent curricular needs, learning and teaching theories, with various texts, or for the development of various skills in learners.

As an example, let us suppose that the first lesson in many texts comprises a variety of socializing techniques in the target language—e.g., greetings, introductions, leave takings. The generic disc would include such materials in the course of a variety of situational "minidramas," providing such contextual clues as relative rank or status of participants, level of formality, gender, relationship, and the like. These segments are carefully and appropriately indexed either on hard copy or accompanying software.

The teacher can then instantaneously access each of these segments, not only utilizing them for the correctness of pronunciation and authenticity of gestures, but also pointing out differences in language and nonverbal behavior occasioned by the social and situational context of the encounter. Students could be "quizzed" by showing them the situation minus an audio track and asked to provide the correct greeting, form of introduction, or manner of leave taking.

The same situational minidramas from which the greetings and leave takings have been abstracted for the first lesson can also be used in later lessons to illustrate a variety of other language features where appropriate. For example, two individuals meeting to discuss hypothetical vacation plans could at the same time be illustrating the vocabulary of sports, travel, and/or entertainment, while providing examples of the use of the subjunctive. The relevant frames would be multiply indexed to make these language features readily accessible.

It need hardly be added that videodiscs can be extremely useful as classroom presentation tools, and therefore extensive lab facilities for individual student use are not an essential ingredient in the initial stages of videodisc utilization.

Generic language discs would need to be very carefully planned in consultation with skilled and experienced teachers from a variety of institutions and a variety of levels. While production of the discs would be expensive, hopefully this would be compensated for by the versatility of the product. Incorporating the desired features into appropriate video and audio materials would be a challenge, but the kind of challenge which can be successfully met by creative educators and educational technologists. Development might begin with an examination of the most popular texts in use in secondary schools and colleges in order to identify commonalities, proceed with the design of discs incorporating and indexing those commonalities, and, finally, conclude with a careful indexing of contents so that teachers can quickly identify particular segments to use at given points in the curriculum.

It may be helpful as well to say what I am arguing against, and this is the production of videodiscs designed on the one hand as vehicles for films or videos that could just as well (and more cheaply) be shown via other media. An equally inappropriate (and non cost effective) approach is to produce discs designed exclusively for use with a single highly developed CAI program. It is unlikely that such materials will be widely enough used to make them a worthwhile

investment, and though any discs produced in this way may be recyclable via repurposing, often these discs are not sold separately from the lesson materials and are therefore very expensive, or they are so specialized that they demand class or homework time away from the text-based curriculum rather than being useful to illustrate and enhance that curriculum. Another constraint is the fact that such materials are individualized and require extensive hardware configurations to serve students adequately.

Another task important to the adoption of this medium— one that might be undertaken by publishers—is to locate and index existing foreign language discs in such a way that instructors could readily identify frames and segments which illustrate and enhance various chapters, themes, and topics in their language texts. Such indexing could be made available to textbook adopters via hard copy as well as in the form of computer software.

The point here is that in order to be sufficiently cost effective to induce educational institutions to invest in the hardware and software, videodiscs must be designed to serve as adjuncts to text-based lesson materials, and if the technology of the videodisc, so marvelously suited to language instruction, is to be effectively utilized to anything like its potential, it must be conceived and produced in a manner consonant with the economics of the situation.

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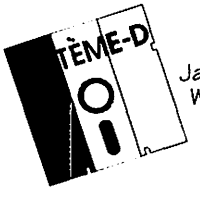

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