

Videodisc Update

By

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CASEY STONE is script and caption writer for the Media Development Project for the Hearing Impaired and has been involved with the videodisc element of the project since its inception in 1978. She earned her Master's degree in elementary education from Long Island University, Brooklyn, New York, and her Bachelor's degree from the College of Wooster, Wooster, Ohio. Prior to becoming part of the MDPHI videodisc team, she worked as secretary to the Project's Associate Director. She has also held positions with Academic Press and the Lutheran Church in America's Office for Communication, both in New York City.

The Media Development Project for the Hearing Impaired has been involved in the design and production of videodisc programs since December 1978, with 10 disc sides to be completed by September 1980. These 10 discs utilize various instructional strategies and capitalize on the videodisc's ability to meet the educational needs of hearing-impaired students. Evaluations of disc materials have verified that the videodisc is appropriate for individualized instruction and that the control and flexibility it provides offer definite instructional advantages.

The theme for this year's Symposium is "Back to Media: How to Use Better What You Already Have." Although the videodisc is not a good example for this topic, it is generally acknowledged that this representative of the "new technology" is here today. Yesterday's dream has become a reality through the major technological breakthrough called videodisc. It can provide two-channel audio, slow motion forward and reverse, step forward, and random access of any of the 54,000 individual frames per disc side. Both interactive and CAI-type instruction can be achieved as well. In short, the videodisc can carry all other media forms—films, filmstrips, transparencies, books, etc.—and provide multi-media learning experiences. An engineering marvel with tremendous instructional applications, the videodisc's flexibility offers unique advantages in the education of hearing-impaired students. It is a teaching tool that appears to be well suited to their communication needs.

THE MDPHI VIDEODISC PROJECT

The Media Development Project for the Hearing Impaired (MDPHI) has been involved in the design and production of videodisc programs since December 1978, with 10 disc sides to be completed by September 1980. Discs have been developed to explore and exploit the unique capabilities of the videodisc in meeting the educational needs of deaf learners. These discs are being produced for playback on reflective optical videodisc systems, where the information is read by a low power laser bouncing off the disc's surface. At present these systems include the MCA DiscoVision player, designed for educational/industrial settings and Magnavox's Magnavision model, which is aimed at the consumer, or home market.

The first disc developed involved the reformatting of extant materials into a junior high social studies lesson on Israel. Based around a captioned film, the disc included a teacher's guide (single frames of print information), pre-entry vocabulary (print, stills, and motion), three filmstrips, and a posttest. The test can be used in a manual mode or can employ a computer interface to provide the student with immediate feedback based on his-her response.

The second disc, "Words in Motion," was a 1-hour program to help hearing adults learn how to read fingerspelling. The disc, which was designed for both the home and educational/industrial videodisc players, not only utilizes a new medium, but also a new approach to teaching fingerspelling.

Traditionally, people have been taught the manual alphabet, one letter at a time, and then taught how to construct words. Reading, it seems, was supposed to follow automatically. It rarely did. People did learn to spell, often quite fluently, but reading remained a problem. Since they had learned to spell letter by letter, most students attempted to read in the same manner. Naturally, this was a tedious process, and words had to be spelled very slowly to assure comprehension. Reading one letter at a time also overlooked the importance of transitions. Because fingerspelling is fluid, the transitions between letters are often as important in reading as are the individual letters themselves.

“Words in Motion” takes a different approach, with the emphasis on seeing words as moving shapes. Instead of starting with the manual alphabet, the program begins with a reading readiness section. This philosophy predicts that once a student can read fingerspelling it is relatively easy to master expressive skills. Therefore, visual discrimination precedes the learning of individual letters.

In the visual discrimination section the user is presented with a pair of fingerspelled words and asked to determine covertly whether they were the same word spelled twice or different words. The correct answer follows, and the fingerspeller repeats the two words. At this point the user is not expected to identify the two words, but simply to notice similarities and differences. The first series of words is two letters long, progressing to three letter words, with the final section composed of a mixture of four and five letter words. Within each section, the words also progress from those with predominantly high-visibility letters to those with predominantly low-visibility letters. Letters such as “a,” “e,” “s,” and “m” are classified as low-visibility while “l,” “c,” “r,” and “w” would be among the high-visibility letters. The disc also contains periodic quizzes, with instructions for the student to review if he or she did not score in the 90th percentile. This procedure helps to insure that the student has mastered the previous material before continuing.

The second half of the disc consists of comprehension exercises. Since fingerspelling rarely stands alone, it was considered important for users to become familiar with reading fingerspelled words within the context of signed sentences. Knowledge of sign language was not a prerequisite for this program, so the signed sentences are also printed at the bottom of the screen with blanks for the fingerspelled words. Initially, students receive pictorial clues as well as contextual and lip movement clues; but as they progress, the pictures are removed, the sentences become slightly more ambiguous, and lip movement is reduced. Again, frequent quizzes monitor the student’s progress and test for mastery of one level before advancement to the next.

The next MDPHI videodisc was conceived as a visual textbook for hearing-impaired high school students. Since the average deaf high school graduate has a fourth-grade reading level, much of what is read in school is either of a lower interest level or else is rewritten to meet the students’ reading abilities. This videodisc, entitled “By Yourself,” is intended to give students a positive reading experience without changing the language of the original literature. It is hoped that the visuals carry enough of the message that even students who do not understand all the words will be able to follow and enjoy the literature sections.

The disc is designed to be used with an educational/industrial player for individualized use, much like a book. A student can view the materials at his or her own pace in a sequence either predetermined by the teacher or selected by the user.

The central theme of “By Yourself” is alienation and solitude. The disc presents different views of this theme through a short story, two poems and a song, as well as an introduction to acquaint students with the two concepts. The short story, “The Pedestrian” by Ray Bradbury, concerns a man who walks alone at night in a futuristic society. The story is completely captioned using Bradbury’s own words and was filmed according to a predetermined caption rate. Like a traditional captioned film, most of the story uses motion. However, because the videodisc has the ability to stop on a specific frame and hold it indefinitely, several sequences which did not require motion were captioned as full pages of text over a still picture. The student can take as long as necessary to read the frame and then resume playing whenever he or she is ready. The two poems, “The Forecast” and “Lost,” and the song, “New York’s Not My Home,” are all real-time sequences, i.e., do not employ still frames.

A glossary defining more difficult words in the literature selections is located at the end of the disc, but can be easily accessed through the player's random access capabilities. Words which appear in the glossary are italicized in the instructional material. If students encounter new words, they can stop the program, search out the definition, and then return to where they left off. Each vocabulary entry consists of a definition and a sentence using the word in context. Where appropriate, visuals are also included.

Other discs which have been produced or are in production include a videodisc demonstration program, a parent education program, and a disc designed for research. "Video Versatility," the demonstration disc, is an introduction to the videodisc for the teachers and administrators in programs for the hearing impaired. Basically, it explains the fundamentals of videodisc technology and shows some of the ways this new technology can be utilized in the education of the deaf. The disc is completely syncapped.

The parent education program, "Language and Learning in the Home," is designed to help parents develop language skills with their preschool hearing-impaired children. The disc, which is part of a larger package of materials, is intended for at-home learning and was produced for the home player. Each of the three segments on the disc deals with a different parent trying to make use of everyday routines to improve his or her child's language. And each of the three children used in the program is actually hearing impaired.

A disc designed to test appropriate instructional design techniques for specific types of hearing-impaired learners is also in production. The disc will include two distinct instructional segments: one concrete, or factual, and the other abstract, or conceptual. Each segment has been produced in visual, print, and combination of visual and print formats. The conceptual segment was also designed to test the use of a definition, relevant and irrelevant-attribute examples, summary, and inserted questions. By utilizing the player's programming capabilities or by interfacing a microcomputer, a variety of instructional treatments can be generated for several research studies. Although the disc is specifically developed for videodisc instruction, results of the research should provide guidance to producers and designers of all types of materials for hearing-impaired learners.

Two other videodiscs currently in the design phase represent a mini-series to develop independent thinking skills in upper elementary hearing-impaired students. The discs are a structured approach to guide students through the process of defining a problem, selecting possible solutions, and working through the alternatives to a successful conclusion.

Each program combines the capabilities of the videodisc with those of an external microcomputer for interactive, individualized computer-assisted instruction. Visual information will be presented via the videodisc using either still or motion sequences as appropriate, while informative material and decision points will be computer-generated print superimposed on the video monitor through a computer interface. Using the microcomputer for the print components saves disc space and also makes the overall program more flexible, since computer material can be changed without remastering the disc.

Students will be presented a situation and asked the best way to define the problem. They will enter their choice of a definition through the computer keyboard and, depending on how the problem has been defined, will be given a list of possible solutions. As they work through their chosen solutions, students will have the opportunity to continue, to try a different track, or to go back and redefine the problems. The first disc is a mystery with the student acting as detective, while the second is a problem

students might encounter in their daily lives. Both programs are designed with more than one correct way to define the problem, as well as with several correct ways to reach a successful solution. In this way it is hoped that real-life problem solving will be more closely simulated. And by working through more than one disc, it is hoped that students will be better able to generalize the thinking process used to solve problems.

VIDEODISC EVALUATION

The Israel disc was extensively field tested at the Iowa and Nebraska Schools for the Deaf with the intent of obtaining utilization information. The primary interest was in how teachers and students were able to use the videodisc materials and equipment.

The Iowa evaluation involved two classes of similar ability (average to above-average). One class viewed all the materials in a group setting with the teacher operating the videodisc machine (Class I). In the other class, students viewed the motion materials (vocabulary and film) as a group, but worked through the single frame instruction individually (Class II). Test scores and time spent on each instructional unit were recorded.

Results revealed great variability in the amount of time it took individual students to work through the materials. In some cases, the fastest student required half the time of the slowest student. Another comparison involved the time a teacher spent showing materials to her class vs. the time students viewed the material individually. Results showed that in some cases the teacher took longer than individual students; in others, he/she presented the material in less time. There was no consistency between teacher presentation time and individually paced time.

There was no statistically significant difference between class scores on the tests, meaning that students in the two classes scored about equally well. However, examination of raw scores and class means revealed that students in the individual viewing condition had higher test scores on materials which one class viewed individually (Class II mean, 72.33) and one as a whole (Class I mean, 68.67).

One of the main concerns of this evaluation was whether or not students could operate the videodisc machine on their own. This was a critical point if the videodisc was to be used for individualized instruction. Original plans were to make a case for the remote control unit that exposed only the buttons students needed to search out and play through the various materials. Since the critical buttons were not grouped together, however, constructing such a case became a difficult task, and it was finally decided that use of such a case would not provide the information needed. If students had difficulty operating the player through the remote control unit, it was necessary to know the full extent of the problem.

Students were given a brief teacher-led training session on how to operate the player. They were also provided with a chart listing each instructional sequence and its frame location number. Using the chart as a guide, students were able to operate the equipment with minimum prompting. The only problem that surfaced during the 2-day sessions was that they occasionally hit a wrong key in entering five-digit frame numbers. Because they were monitoring their entries, they always knew they had made a mistake; but they did not know how to correct it. Use of the CLEAR button had not been explained. After brief instruction about this function, however, they were able to continue without any problem.

Students seemed to view the remote control in the same manner as a hand calculator. They were not intimidated by the equipment, but they were careful in using it. They clearly enjoyed controlling the player through the remote control. When asked if they liked working with the videodisc machine, they all replied "yes," and rated their experience the highest possible on the scale used. One class wanted to continue the evaluation another week, even though it involved extensive testing.

Teacher response to the videodisc was also positive. They liked the multi-media approach of having various materials (film, filmstrip, etc.) on one disc, and they reported that they would use the materials again with a similar class. They perceived the major advantage of the videodisc for the deaf learner to be student and teacher control of the presentation. Students and teachers can stop, slow down, and/or sequence materials according to learning styles and needs.

The evaluation at the Nebraska School for the Deaf centered on students' use of a videodisc/microcomputer system using a Radio Shack TRS-80 computer interfaced with the educational/industrial model videodisc player. All viewing was done on an individual basis. Students first viewed the videodisc instruction and then completed the multiple-choice posttest, making responses directly through the computer keyboard. Directions on how to respond and advance through the test were computer-generated. Students were asked to try to follow the instructions on their own, but were to ask for help if they had problems or questions. The evaluation revealed that students had difficulty following the computer-generated directions and often needed help. When provided with prompting and further explanation, however, they successfully mastered the computer operation, and clearly enjoyed the personalized, immediate feedback that the computer was able to provide. Results indicated that students cannot be expected to successfully complete a computer-assisted lesson without preliminary, teacher-led training on the use of a microcomputer and CAI conventions.

Evaluation of the fingerspelling videodisc is currently underway which will use a microcomputer for data keeping. Students will enter all responses directly through the computer keyboard. The evaluation should determine the validity of the instructional approach and provide comprehensive data for testing the hierarchical progression from simple to more complex skills.

Preliminary testing of the visual textbook videodisc has also begun in Iowa, Maryland, and Maine. A videocassette version, prepared from the original videodisc tape master, is being compared to the original literature selections, all of which are in print form. Students in both conditions are being given objective tests as well as attitude questionnaires intended to determine their feelings about the reading experience.

VIDEODISC AVAILABILITY

If you have now been sold on this new technology you are probably wondering how you can go about adding videodiscs to your school's media center. Two different disc systems have been mentioned here, and it is necessary to emphasize the distinction at this point. The home or consumer model, Magnavision, is less expensive than the educational/industrial model, DiscoVision, but it also lacks the random access capabilities and programmability of the more complex system. Magnavision players currently sell for \$775 and can be purchased at Magnavox dealers in a dozen or so of the country's larger cities. DiscoVision players, on the other hand, must be ordered from DiscoVision Associates in California. These players are available at approximately \$3,000 or \$2,250 each for five or more.

It is also important to point out that at this time the videodisc is not a recording medium. All production must be done initially on film or videotape and then sent to a mastering facility to be transferred to disc. The price to produce a single disc is fairly high, but because duplicates are made through a “cookie cutter” process, discs become cost-effective in quantity. The videodisc is not a replacement for videotape, but rather a new and exciting adjunct to it.