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AUTHOR	McLean, Lois
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ABSTRACT

This digest discusses the nature of interactive videodiscs and their educational applications, provides information about educational uses of videodisc technology, and presents lists of videodisc-related organizations, books, and periodicals. A general description of a reflective optical laser videodisc is presented, as well as the equipment necessary to use a videodisc program. The categorization of videodisc systems according to their level of interactivity is explained: (1) Level 1--a stand-alone videodisc player which may allow dual audio and random access of frames but has no memory or processing power; (2) Level 2--a stand-alone educational/industrial player allowing disc control through an internal programmable microprocessor; (3) Level 3--a system which adds the power of an external computer through the connection of an interface device; and (4) more sophisticated systems which have capabilities far beyond those of the original Level 3 system. Educational uses of videodiscs are also discussed, including simulating expensive or dangerous procedures or human interactions; teaching standardized procedures; storing audiovisual databases; showing visual details and reviewing and comparing visual materials; and using the two audio tracks to store different information for foreign language instruction, or for adapting materials for varied ability levels. Finally, several educational projects that are experimenting with the principles of interactive video are described, and resources for learning more about videodiscs in education are presented, including three organizations, three books, and several periodicals. A list of references is also provided. (JB)

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ERIC DIGEST

VIDEODISCS IN EDUCATION

Videodiscs could have a revolutionary impact on the use of audiovisual media in education. What makes the videodisc so attractive? Videodisc systems can combine the best features of instructional television and computer assisted instruction. They can provide individualized, self-paced instruction with feedback and remediation, while incorporating all traditional audiovisual media into one easy-to-use, durable format.

The real revolution, however, is that videodiscs allow the creation of *interactive* video programming. Traditional video programs play linearly, in a pre-planned beginning-to-end sequence. With the videodisc, learners, instructors, and lesson designers have an opportunity for input and control over the sequence of the program. The sequence is dynamic, changing in response to overall objectives, as well as the style and level of instruction.

What is a videodisc?

The most promising format for educational applications is the reflective optical laser videodisc. These discs resemble shiny, silver audio records. They are prepared from a master videotape transferred to disc through "mastering," which imprints the disc with microscopic pits to be "read" by a laser beam during disc play. Slides, film, video, and print can all be transferred to videodisc.

A standard size videodisc can hold up to 30 minutes of high-quality, motion video, or up to 54,000 still frames on each side. Modulation of the laser beam allows rapid, random access to any single frame on a disc side, without wear on the disc surface.

Additional features include dual audio tracks or stereo sound, variable-speed motion and single frame advance in forward or reverse modes, and the capacity for branching to specific frames or segments in response to viewer input.

What equipment is required to use videodisc programs?

System hardware configurations usually include a videodisc player, video monitor, microcomputer, computer screen, and an interface to connect the computer and the video player. Videodisc systems are categorized according to their level of interactivity.

- A Level 1 videodisc system is a stand-alone videodisc player, which may allow dual audio and random access of still frames, freeze-frames, auto-stop, and chapter search, but has no memory or processing power. A keypad is used to input data and output may include audio from one of two available channels together with standard motion and still frame graphics. The user can select what is to be viewed next and which audio channel will be heard.
- Level 2 systems use a stand-alone, educational/industrial player allowing disc control through an internal programmable microprocessor. The keypad at this level can be used for numeric entries and some special options. While the format of the output is essentially the same as it is for the Level 1 player, the microprocessor has enough memory to receive multiple programs and provide a more sophisticated level of interaction for the user.
- Level 3 disc systems add the power of an external computer to a videodisc player by connecting them with an interface device, usually a computer card. In addition to the videodisc for audio and motion graphics and still frame graphics, media for such systems include floppy diskettes for the computer programs. An audiocassette can also be used to provide random access sound over still frames and over computer graphics. Authoring packages are available to assist Level 3 program designers.
- More sophisticated systems are being developed which have capabilities far beyond those of the original Level 3 system. For example, a graphic overlay capability has been developed that allows the display to contain graphics generated by a computer, visuals from a videodisc, or a combination of the two, without the user being aware that the material comes from different sources; availability of more powerful (and less expensive) microcomputers has made possible an expansion of system control; and digital recording of audio can be used to greatly extend the amount of stereo sound that can be provided over still graphics on a single videodisc.

Compared to videotape, videodiscs have the advantage of increased durability, rapid access time, and, in large quantities, lower replication costs. Unlike videotape, however, once a videodisc is pressed, it is not possible to record over it, although very expensive recordable disc formats are available.

What are the educational applications of videodiscs?

In addition to being useful in such traditional computer assisted instruction (CAI) formats as tutorials and drill and practice, videodisc technology holds special promise for a range of applications, including:

- Simulating expensive or dangerous procedures, as in physics or chemistry experiments, or in teaching the operation of mechanical equipment;
- Simulating human interactions to provide realistic practice in interpersonal situations, such as between salespersons and clients, teachers and students, medical personnel and patients, counselors and their clients, and teachers and parents;

- Teaching standardized procedures that must be performed in a specific way, such as first aid training;
- Storing audiovisual databases, such as collections of still photographs or illustrations;
- Showing visual details and reviewing and comparing visual material, as in art education, health education, and technical training; and
- Using the two audio tracks to store different information about the same visual images for foreign language instruction, or for adapting materials for varied ability levels.

Who is using videodiscs in education?

Videodisc is still a new technology. Few commercial educational videodiscs are yet available. The situation is improving, with electronic publishing attracting increased interest from instructional materials producers. The first videodiscs have been primarily the product of research and development projects, although some of these are available for purchase or loan. Several projects are experimenting with the principles of interactive video by creating interactive videotape programs.

- The pioneering *Nebraska Videodisc Design/Production Group* has produced videodiscs on many topics, including whales, metrics, basic tumbling, Spanish pronunciation, and decision-making for the hearing/impaired, and has shared information through workshops, seminars, and publications.
- Utah State University has been actively involved with disc technology, producing discs for special education and other applications. The federally-funded *Videodisc Interactive Microcomputer (VIM) Institute* enabled elementary schools and other educational institutions to experiment with videodiscs in the classroom.
- Additional institutions with disc projects include the Minnesota Educational Computing Consortium (MECC), the University of Washington (health sciences), the University of Iowa Weeg Computing Center (art history, medical education), the University of Delaware (music), the Massachusetts Institute of Technology, Lehigh University, Simon Fraser University, Brigham Young University, and Pennsylvania State University.

Commercially available discs have addressed topics related to computer literacy and new electronic technologies, astronomy and space exploration, social studies, biology, music, art history, and physics. Major educational publishers are moving into the field. For example, Harcourt Brace Jovanovich, Inc., is developing a program for K-12 to accompany a textbook series.

Although research is still limited, early findings indicate that "interactive videodisc instruction, which is thoughtfully and systematically developed, and shows creative new instructional strategies, is beginning to demonstrate consistent positive results" (DeBloois, Maki, & Hall, 1984, p. 53). Studies have found that students learn more efficiently and enjoy learning more than with traditional approaches.

How can I learn more about videodiscs in education?

Although educators are often anxious to try interactive video in their classrooms, information to help them get started has often been difficult to find. Phil Kessinger, a secondary school history teacher in Eugene, Oregon, was an early advocate of the medium and received a grant to provide inservice education about videodiscs to teachers in his district. He is helping to organize the Special Interest Group for Videodisc Interactive Microcomputers (SIGVIM) for educators who wish to share information about videodiscs. For further information, contact Phil Kessinger, SIGVIM, International Council for Computers in Education (ICCE), University of Oregon, 1787 Agate Street Eugene, Oregon 97403 (503-686-4414).

The following additional resources should be helpful for anyone who would like to know more about this exciting technology.

Organizations:

International Interactive Communications Society (IICS). Local chapters in major cities, newsletter. Contact IICS National Office, 2120 Steiner Street, San Francisco, CA 94115 (415-922-0214).

Nebraska Video Design/Production Group. Newsletter, workshops, seminars. Contact the Videodisc Design/Production Group, KUON-TV, University of Nebraska-Lincoln, P.O. Box 83111, Lincoln, NE 68501 (402-472-3611).

Society for Applied Learning Technology (SALT). Annual conferences, publications. Contact SALT, 50 Culpeper Street. Warrenton, VA 22186 (703-347-0555).

Books:

Daynes, R. & Butler, B. (1984). *The videodisc book. A guide and directory*. New York: John Wiley and Sons.

Floyd, S., & Floyd, B. (1982). *The handbook of interactive video*. White Plains, NY: Knowledge Industry Publications.

Schneider, E., & Bennion, J. (1980). *Videodiscs*. Englewood Cliffs, NJ: Educational Technology Publications.

Periodicals:

The Videodisc Monitor, Videodisc News, Video Computing, Videodisk/Optical Disk Magazine, and articles in *Electronic Learning, The Computing Teacher, TechTrends* (formerly *Instructional Innovator*), and *Performance and Instruction Journal*.

References:

Clark, D. Joseph (1984, September/October). How do interactive videodiscs rate against other media? *Instructional Innovator, 29*(6),12-16.

Currier, Richard L. (1983, November). Interactive videodisc learning systems. *High Technology, 3*(11),51-59.

DeBloois, M., Maki, K.C., & Hall, A.F. (1984). *Effectiveness of interactive videodisc training: A comprehensive review*. Future Systems Incorporated/The Videodisc Monitor.

Faust, J. (1985, July/August). A discography of available education discs. *The IICS Journal*, 3,7,9,10,12.

Reinhold, F. (1984, April). How they're using interactive videodiscs. *Electronic Learning, 3*(7),56-57.

Withrow, F. (1985, Fall). Videodiscs: The thinking person's audiovisual. *American Educator*, 22-25, 40-41.

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