Interactive Video:
A Report from The ACE Western Regional Workshop

by B. Jeanne Gleason, Scott V. Fedale, David A. King, Mary Miller

The ACE workgroup involved communicators, educators and subject specialists from a number of states and Canada. This is a report of a review of interactive video, reflective of opinion by those workshop participants. Guidelines are suggested for national development of the technology. Recommendations include a national database of titles; national coordination with published specifications for share discs; a national consensus to share discs and programming code, possibly through sales; copyrights allowing user modification; national standardization of equipment and authoring languages; publication credit for developers of interactive video; and integration of interactive video with other emerging information technologies.

Philosophy of Interactive Video Use

Today's consumers of information are demanding customized answers, delivered in a quick, convenient and entertaining way, usually after–hours and away from traditional points-of-delivery (Friedenreich & Doyle, 1986; McCandless, 1987; Hussey, 1985). Many consumer demands currently can be met with a technology that allows for personalized response to their concerns. This technology is called "interactive video", and there is every indication that it may become a major educational medium for reaching specific audiences of land-grant universities and USDA's Cooperative Extension Service (Miller, August 1987).

For the first time, commercial entities seriously are challenging Extensions' information distribution network. it seems probable

The first three authors listed are ACE members and organizers of the workshop. Gleason, associate agricultural editor, New Mexico State University, is chair of the ACE Interactive Video Special Interest Group. Fedale is head of the Agricultural Communication Center, University of Idaho. King is coordinator, electronic media, Agricultural Experiment Station, Oregon State University, and director-elect/acting director, ACE Western Region. Miller, Virginia Polytechnic Institute and State University, was guest workshop speaker.

that if Extension and the land-grant system do not develop viable educational programs which employ interactive video, someone else will (Spitzer, 1987).

Information Delivery in Transition

Any review of interactive video would be insufficient and shortsighted if it did not acknowledge the fact that the technology is only a small portion of an entire generation of emerging technologies which is changing the face of information delivery (Hussey, 1985). Each month brings new advances in CD/ROM (compact disc/read only memory), digital audio, and DVI (Digital Video Interactive Technology). Interactive video is not the solution for all communications problems, nor will it replace traditional publications, news stories or video tapes. But, it is a tool which must not be ignored by an educational organization striving to reach an ever-changing clientele (Dillman, 1985).

Definition of Interactive Video

"Interactive video is . . . any video system in which the sequence and selection of messages is determined by the user's response to the material." (Iuppa, 1984, p. 5) In a practical sense, this means that instead of viewing all information linearly, as in traditional video tapes, the user responds to questions, menus, or printed material and receives feedback in the form of text, stills, video or audio messages.

When interactive video is mentioned, images of highly complicated, expensive projects may come to mind and be rejected without adequate consideration of the medium. It is important to note that there are various levels of interactive video which have strong impacts on the amount of program development and equipment needed (Fort, 1984; Floyd, 1985).

The simplest design, called Level I, consists of a video player—tape or disc—and a television set or monitor. The user operates the player to review material. The amount of interactivity is limited by the functions of the player. A remote control is usually included for ease of operation.

Visually, a Level II system may appear much the same. The equipment most often involved includes a videodisc player with an internal microprocessor programmed to perform certain playback sequences and respond to viewer choices during the program. The program control is encoded on the disc.

Level III involves a computer which responds to the user's input. The computer controls all other devices, such as a video-tape or video disc player and audio devices. This level of interactivity provides all the benefits of Computer Aided Instruction

(CAI)—branching, user–controlled pace, lesson management, record keeping and feedback. This level can involve special accessories such as touch screens, light pens, bar code readers, and devices which allow simulated equipment adjustment.

Application of Interactive Video

"Electronic Technology: Impact on Extension Delivery Systems" (Hussey, 1985) identified three major functions of Extension–information delivery, educational delivery and problem solving. Interactive video can be of value in all of these areas (Goldberg, 1983; Held and Wiemann, 1984; DeBloois, 1982). For example, it can provide a consumer with information in a mall on shopping for a microwave . . . or train a farmer in proper pesticide application techniques . . . or help home-owners identify which garden fertilizer to use. Thus, one can see that interactive video can be an effective and efficient aid to help Extension personnel do their jobs.

The *Training and Development Journal* (Donahue and Donahue, 1983) reports, "Trainers generally agree that people retain about 25 percent of what they hear, 45 percent of what they see and hear, and 70 percent of what they see, hear and do. Interactive video programs keep the learner seeing, hearing and doing."

At this time, this technology can have its most significant effect for Extension in "how to" training for individuals or small groups, and point-of-delivery information transfer to large groups on a one-on-one basis. Information kiosks could be located in shopping malls, entertainment centers, garden centers, grocery stores, libraries, and other public places. Used properly, interactive video can be more cost efficient and less demanding on staff time than the traditional one-on-one Extension training model.

The effectiveness of interactive video is well documented. IBM Corp. evaluated the effectiveness of various teaching methods and found student learning gain scores were as much as 50 percent higher with computer–based instruction involving video than with traditional methods. The percentage of students reaching mastery (80 percent on the post test) increased by more than 300 percent (Vadas, 1986).

In a study which contrasted learning and retention rates of various instructional media (Clark, September 1984), researchers found that ". . . students using videodisc learned the technique in one-third the time required in a conventional teacher/student situation. Retention rates doubled."

National Program Planning and Coordination

To maximize program development, there should be a national planning effort to coordinate the development of shared video-discs. Ready-to-use program coding, requiring little or no

modification, would help Extension and university users justify the hardware costs, even if they do not have an interactive video production unit on campus. Possible topics for national disc development include consumer education, human nutrition, home horticulture, home energy, insect identification, conservation, first aid, clothing, budgeting, and business management. The task force which organizes the disc should publish specifications well in advance of the deadline and give specific video assignments to various states with proven expertise and video production skills.

This national development could be coordinated through the newly organized Interactive Video Special Interest Group of Agricultural Communicators in Education (ACE) and through the Interactive Video Extension Network (IVEN). The coordination team should include administrators, educational designers, program leaders, video producers, and computer specialists.

Any such national effort must involve (1) choice of appropriate subject matter; (2) good educational design; and (3) high quality visuals. High production values play a large role in the effectiveness of an interactive video program. Americans are now visually literate and if visual, aural and textual components do not meet a minimum level of professionalism, the viewer will simply tune out, even in small group training sessions. Poor technical production damages the program credibility.

National Marketing

National consensus is needed so that all interactive video programs developed within the land-grant system will be made available to other states in some manner. While the policies for sale, trade or loan of materials may vary, it is important that federal and state administrations work closely with interactive video development groups to establish clear guidelines.

In additional, possible copyrights on land-grant developed material should allow other USDA users to modify the computer programming and graphics, and even program audio, to make the interactive video program more effective for user states.

The national video data base of Dialcom, Inc. should be expanded to include interactive video programs, both those completed and in development. Plans are underway for an Extension Service–USDA representative to contact 10 states per month to encourage updates of the video tape data base as well as interactive video listing of Dialcom.

On the practical side, development of interactive video programs will be inhibited unless there is a national consensus that institutions will provide credit to subject matter specialists, computer program designers, video producers, and educational designers for work during evaluation, promotion and tenure pro-

cedures. Interactive video, which requires a considerable invest-
ment of time and effort, must receive equal recognition for pro-
motion purposes as do other teaching, research and publication
activities.

For this recognition to happen, attitude changes must occur at
the administrative level. National groups, such as ACE, ESCOP
and ECOP, can encourage this change in attitude toward
publication alternatives. Administrators should understand that
the team approach needed for a full–scale interactive video
project is likely to require additional employees (Davidove,
1986). Specialists must be assembled into an integrated team
effort, not unlike recent staffing trends for biotechnology
institutes and laboratories.

Hardware Costs

A cursory look at the plethora of interactive video hardware
and software on the market (Miller, September 1987),
underscores the problem in specifying the "basics" in hardware
and software needed to get started. Also, the wide variety of in-
compatible pieces points out the need for national standards to
ensure that states can share interactive video discs and software.
The national trend appears to be toward IBM–compatible com-
puter systems. The computer used at the authoring station should
have, at least, 640K of internal memory with a 20-megabyte hard
disc, and will probably cost under $2,000 per computer. The
computer for interactive video program delivery needs, at least,
640K of internal memory and will probably cost $1,500.

The delivery of the video, still images, and audio messages
will require a video playback device. An industrial grade
videotape player with the required two audio channels (one for
the control code) will cost between $700 and $1,500.

The system also needs a video monitor—either one with
capability to display both computer text and graphics; or two
separate monitors. Monitor costs range between $800 to $1,200.

In some cases, depending on the hardware configuration and
the software purchased, additional equipment is needed to link
the video device with the computer. The cost of this interface
ranges between $300 to $800.

The total cost of a basic interactive system can range from
around $3,000 to $5,000, depending on whether it uses tape or
disc and whether it is an authoring or a delivery station. At this
time, many systems also use graphic overlay cards, touchscreens,
voice reproduction, voice recognition capacity, and advanced
graphic capability (Braden, 1986). This type of system costs
between $10,000 to $12,000.

The importance of investing in a superb kiosk design cannot
be overstated. An effective educational delivery kiosk must do

much more than safely house the equipment. It must create a total environment able to compete with commercial presentations for the consumer's attention.

Authoring Language

As already stated, the key to economic interactive video development lies in nationwide standards for exchange of discs and coding. Therefore, the authoring language used must be able to function within a wide variety of hardware configurations, such as IBM Info-windows, Sony View, Pioneer Level Three System, or NCR Interact TV. For maximum versatility and minimum training in each state, land-grant standards should comply to the ES-USDA standards for authoring language and equipment configuration. At this time, most states (11 out of 13) involved in Level III interactive video programming use the IMSATT authoring system. The language is evaluated in Data Training (Staiti, October 1987).

Development Costs

Although the master disc costs only $2,000, with $20 for each additional copy, there will be extensive costs for program design, development and video production prior to disc mastering. Video production for customized instruction packages , alone, may range between $45,000 and $260,000. This does not include the cost of the educational designers or the computer programmers (Kearsley and Frost, 1985).

On the other hand, not every land-grant unit needs to be in the business of producing complex interactive video. Simple, menu–driven interactive videodiscs created from high quality educational video programs, developed for other uses, can cut costs considerably, especially when combined with a pre-existing program code.

Universities with no interactive video design team and little hardware should adapt existing materials from other states. This underscores, again, the urgency for national standards and for documentation of program code.

Because interactive video technology appears to have promise in a large number of areas (DeBloois, 1982), there are many outside grants available. In fact, many agencies, which control grant funds, are looking for innovative, dynamic information delivery and dissemination programs to advance educational needs.

Extension Service and university administrations can justify some of the cost of interactive video development by reduced cost for staff and leader training, and travel. Interactive video does not ask for a raise, charge overtime or mind teaching the same lesson hundreds of times. In addition, the impact on

legislative funding could be affected favorably by renewed extension visibility in public locations through the use of high tech, mass–audience–access interactive video.

While retraining for use of interactive technology may be an additional cost consideration, it usually can be conducted on a pilot or gradual basis. Such training, no doubt, will be an important part of a nationwide trend toward retooling educational professionals in the use of all merging technologies, such as satellite education, teleconferencing, use of data bases, and computer–based instruction.

Conclusion

Today, Extension and the land-grant system are faced with unprecedented challenges to their existences as highly respected information sources. The modern information world is complex and interconnected. The audience is more sophisticated and technologically literate. If we are to meet the needs of present and future clientele, we must supply our Extension faculty with the proper tools, and expand our services to include state-of-the-art technologies, such as interactive video. Only through the use of such new communication tools can the land-grant system hope to maintain its enviable position as a credible source for a wide variety of education information. However, the demands for staff time and budgets make national coordination indispensable.

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