Guide for Designing Effective Distance-Bridging Instruction or How Can You Help People Learn When You Can’t Even See Them
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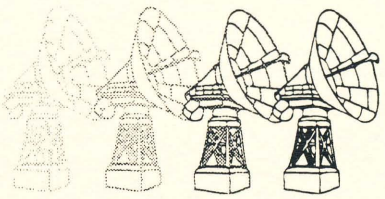
Guide for Designing Effective Distance-Bridging Instruction, or: How Can You Help People Learn When You Can't See Them?



By S. Joseph Levine and Michael V. Doyle • Department of Agricultural and Extension Education

INTRODUCTION

The age of technology has brought tremendous change and, at the same time, tremendous potential for the Extension educator. For the first time, educators have available for everyday use a collection of media to use in creating learning opportunities even for learners a great distance away. Devices that just a few years ago seemed to be far into the future are now at our doorstep begging to be used. Our vocabulary has become loaded with such terms as CD-ROM, virtual reality, satellite transmission, CODEC, interactive television and fiber optics.

The challenge for the Extension educator is not only to begin to adopt some of these new technologies for use in extending educational opportunities, but to develop a sensitivity and concern for creating effective adult learning environments assisted through the use of new technologies. In other words, it's not just a matter of sending an instructional program out via satellite -- the key is designing the program and the variety of activities that accompany the satellite transmission to make learning a dynamic and powerful outcome.

This guide is designed to help Extension educators meet the challenge of designing effective instructional programs that can bridge distances. It is based on two major premises:

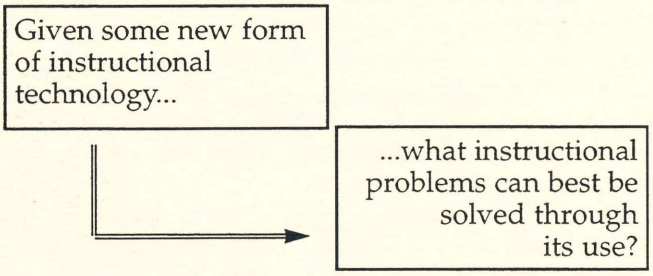
First, a strong sensitivity to the learner is the essential starting place for any instructional design consideration. The most exciting new technology will be only as effective in supporting instruction as our ability to link to the unique learning needs and characteristics of the learner.

And second, our ability to use new technologies effectively for instruction depends greatly on the options that we feel that we have. A rich base of understanding of optional instructional technologies provides the setting for creative and meaningful instructional designs.

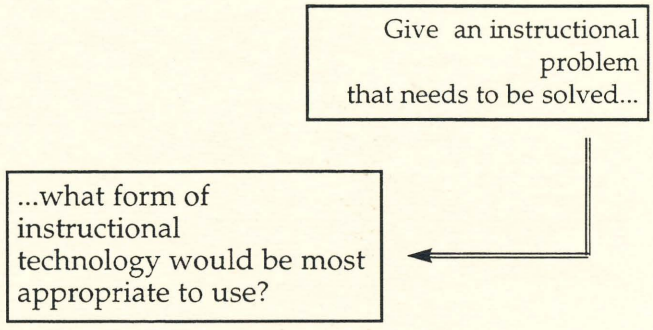
SO, WHAT'S THE BEST TECHNOLOGY FOR TEACHING AT A DISTANCE?

Traditionally, there have been two major approaches to instructional change and innovation: the technology-based approach and the instructional problem-based approach. The approach you used depended on your comfort and knowledge of new instructional technology. The educator working from the technology-based approach would be quick to respond to our opening question -- What's the best technology for teaching at a distance? -- by identifying a favorite technology that seemed to hold promise for responding to learning needs. On the other hand, the educator working from the instructional problem-based approach would side-step the question and remind you that we must first look at the content to be delivered and the unique characteristics of the learners we are trying to reach.

Technology-based Approach



Instructional Problem-based Approach

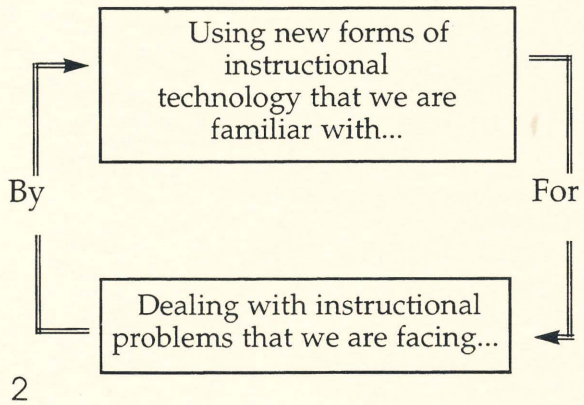


Both approaches can be "correct", depending on your orientation and experience. The instructional designer who enjoys using new technology and isn't threatened by its very existence would tend to use the technology-based approach. On the other hand, an educator who interacts daily with adult learners who have significant learning needs might tend to use an instructional problem-based approach.

The answer to the question about technology for distance learning has traditionally involved an educator, often referred to as an instructional developer, positioned between the knowledge of new technology and the awareness of instructional problems and capable of talking to both sides. The challenge for this intermediary would be to link new instructional technology with important instructional problems. In industry, this person, often called an engineer, helps to solve problems through applications of new technology.

In today's information age, as instructional technology has become more and more commonplace and familiar to the Extension educator, a major shift has occurred--these two approaches have begun to merge. All of us have used computers and know about their potential for helping us selectively access zillions of bits of information. All of us know about satellite broadcasts and how they can bring us directly to remote places in the world to see history happening. All of us have experienced the excitement of a conference call by which we can discuss complex issues and make decisions without leaving the comfort of our offices. The information age has now provided the Extension educator with powerful instructional technology to solve the instructional problems that we face each day. Tomorrow has arrived and tomorrow's technology now surrounds us.

Today's Information Age Approach



It may be one that we are most familiar with, can be used effectively to carry the content we are concerned with, and meets the unique learning needs of those we're trying to help learn.

IF THE TECHNOLOGY ISN'T THE CONCERN -- WHAT IS?

This is where we wanted to be at the beginning of this publication: focusing on our two major premises and doing it within the framework of how we can effectively use the powerful technology that surrounds us. We can look at a variety of principles to guide our instructional design, principles that are sensitive to the learner and are drawn on an ever increasing number of instructional options. They are:

▼▼ Engage the learner in meaningful tasks. Learning is an active process. To assist the learner, make sure you design into the experience some level of activity. This activity can be as simple as a fill-in-the-blanks guide for the learners to take notes or a topical outline that clearly shows the learner where we are in the program, where we've been and where we will be going next.

Whatever the activity, it should clearly be related to the content being presented and provide an opportunity for the learner to have that content reinforced. If all else fails and you want to make sure that you have a meaningful task for the learner that will support your content, just stop your presentation for a while and have the learners, in small groups, discuss what you've presented. This can be followed with a short question-and-answer period. Then back to your presentation.

▼▼ Consider the total learning experience: before - during - after.
Sometimes we get a bit presumptuous and assume that the instructional activity that we have created is enough to "do it all." For instance, we may create an instructional videotape that we assume will magically transport learners into our topic, teach them the content and then deposit them back in their chairs all filled up with the information. It usually doesn't work this way!

A good instructional activity must begin with an understanding of the types of experiences the learners have already had, the knowledge they already possess, and their objectives -- what

they'd like to derive from the experience. This is hard to do when we're teaching at a distance, but it's not impossible.

Try using a local facilitator and provide suggestions for some learner activities before the instructional videotape begins. Have learners fill out a worksheet that introduces the topic and also challenges them to review what they already know about the topic. Have the learners share their responses to the worksheet. After a short discussion, the facilitator can begin the tape.

Build in a few stop points when the facilitator can again provide the learners with an opportunity to localize the information and resolve questions that might have arisen. When the tape is finished, the facilitator should help the learners discuss the main ideas presented on the tape and share examples of how they can put the information to use in their own setting.

By considering the total learning experience, not just the distance-bridging instructional activity, you can create a rich environment to help the learners apply the ideas that you've presented.

▼▼ Don't depend entirely on one technology.
Research continues to point out that we all learn in a variety of ways. Not only does each of us have different learning styles, depending on the topic, but the members of any learning group are sure to have a variety of different preferences, all of which will be operating at the same time. If we are smart, we'll use a number of instructional technologies to support our instruction. The satellite telecast that we've designed might be the major vehicle for presenting our content, but it will greatly assist our attempts to help people learn if we also include a note-taking guide (a chance for the learner to write), an opportunity for small group interaction during the broadcast (an opportunity for discussion), an article or two to take home (an opportunity for the learner to return to the content at a later time), a panel discussion (hearing the ideas presented and reinforced by local people), and other strategies that reduce our dependence on a single medium to do everything.

Using a variety of technologies to present and reinforce the information that we're communicating increases the likelihood that the learners will hear our message. And that's the name of the game!

▼▼ Prepare the learner for the learning experience.
It's unlikely that the learners are all sitting on the edge of their seats just waiting for the instruction that you're sending their way. Assume, instead, that each of your learners has been thinking about something completely apart from the content you're presenting -- their minds are a million miles away.

Provide ample preparation to help the learners zero in on the topic and get up to speed. This can be done by a local facilitator who begins with a short discussion of the topic. If you're not sure if a facilitator will be available to assist, you may want to consider sending out an article or two that the learners can read before the day of the instruction. Or you could use the first segment of your program to review basic concepts and clarify what the program will cover. Assume that the learners need an opportunity to clear out what's in their minds and then settle down to the topic that you're bringing to them.

▼▼ Provide preliminary information to allow the learners to self-select the experience.
Try to avoid using a cute title for the learning activity that you're designing. Make the title as clear and descriptive as possible. This is the first chance that you have to help learners understand what the focus of the activity is and to decide whether the activity relates to their concerns. This can be further reinforced by clear advertising that describes the specific things that the instructional activity will focus on and what each participant can expect to learn. The single greatest factor that affects how well your instructional activity will work is getting the right group of learners to participate in your activity. If your learners are all asking themselves the very questions that your activity answers, then you've got a winner! Do everything in your power to provide complete and accurate advance information that lets the right learners select your program.

▼▼ Balance delivery of new information with opportunity to reflect on prior experience.
People don't change their behaviors because some new information has been delivered to them -- they change their behaviors when they apply the new information to their particular situation. So, our challenge isn't just to send

information out to the learners, but also to help them put the information to use.

The step between hearing something and acting on it is called reflection. So, when you design your instructional activity, try to create a balance between the time you devote to presenting information and the time you allow for the learners to reflect on the information. It is through reflection that they will move closer to action.

The key to reflection is to provide enough time for the learners to do some thinking. Challenge them with questions, ask them to think about other similar situations, share some of your own experiences. Then - STOP!

Provide some quiet time for the learners to think and reflect. Then, after a few minutes of individual reflection, have the learners share their thinking in small groups. Then you can get back to the content. Breaking up your content with opportunities for reflection will tremendously increase the potential for the learners to put your information to good use.

APPENDIX A
INSTRUCTIONAL STRATEGIES THAT UTILIZE BROADCAST TELEVISION

Broadcast television is a powerful medium that has become a regular part of our everyday life. For most of us, broadcast television is linked to the idea of "sit back and relax." We turn on "the tube" and let it take over while we just vegetate.

This is certainly not what we have in mind when we use broadcast television for instructional purposes. The learner's role in the instructional use of broadcast television must be active and participatory. The more involved the learner is with the instruction provided, the greater the chance that the desired learning will occur.

The following strategies suggest various combinations of instructional activities that can accompany a televised instructional broadcast.

Strategy 1

Introduction & welcome	Live (local site)
Videotape presentation (view & discuss)*	Prerecorded (local site)
Broadcast TV/satellite presentation (questions & answers with expert[s])*	Live (network broadcast)
Final discussion	Live (local site)
Wrap-up & conclusion	Live (local site)

Strategy 2

Introduction & welcome	Live (local site)
Broadcast TV/satellite presentation (lecture, panel discussion, etc.)*	Live (network broadcast)
Discussion and development of questions	Live (local site)
Conference call for question/answer session (using 800 number)*	Live (network involvement)
Wrap-up & conclusion	Live (local site)

Strategy #3

Introduction & welcome	Live (local site)
Broadcast TV/satellite presentation (lecture, panel discussion, etc.)*	Live (network broadcast)
Discussion and development of questions	Live (local site)
Broadcast TV/satellite with telephone link for question/answer session*	Live (network broadcast)
Wrap-up & conclusion	Live (local site)

Strategy #4

Introduction & welcome	Live (local site)
Videotape presentation (view & discuss)*	Prerecorded (local site)
Panel discussion (react/discuss/localize)	Live (local site)
Broadcast TV/satellite panel - reactions and question/answer period via telephone link back*	Live (network broadcast)
Discussion & reflection	Live (local)
Wrap-up & conclusion	Live (local site)

Strategy #5

Read materials/listen to tape prior to session*	Individualized
Introduction & welcome	Live (local site)
Discussion and development of questions	Live (local site)
Broadcast TV/satellite presentation (questions & answers with expert[s])*	Live (network broadcast)
Discussion & reflection	Live (local)
Wrap-up & conclusion	Live (local)

*to be packaged with guide for later dissemination

APPENDIX B
TYPES OF ELECTRONIC DELIVERY SYSTEMS

SATELLITE VIDEOCONFERENCES

Videoconferences are beamed to downlink dishes literally anywhere on the North American continent. Anyone with access to a downlink satellite dish linked with a television monitor can tune in.

This information delivery system gives people the option of attending an educational session nearby rather than investing time or money to go to the distant place where experts may be making presentations. The experts also save travel time and money by making presentations once in a central place rather than presenting the material several times at meetings across the state or beyond.

Often, videoconferences include time for the people watching to phone in questions to be answered on the air by the specialists. Usually such programs are taped and available for viewing later.

SUMMARY OF STRATEGIES 1-5, BY SEGMENTS

Segment	Live/Prerecorded	Strategy #				
		1	2	3	4	5
Read materials/listen to tape prior to session	Individualized					X
Introduction & welcome	Live (local site)	X	X	X	X	X
Videotape presentation (view & discuss)	Prerecorded (local site)	X			X	
Satellite presentation (lecture, panel discussion, etc.)	Live (network broadcast)		X	X		
Satellite presentation (questions & answers with expert[s])	Live (network broadcast)	X		X		
Panel discussion (react/discuss/localize)	Live (local site)				X	
Discussion and development of questions	Live (local site)		X	X		X
Satellite panel - reactions and question/answer period via telephone link	Live (network broadcast)	X				
Conference call for question/answer session (using 800 #)	Live (network involvement)		X			
Satellite with telephone link for question answer session	Live (network broadcast)			X		
Discussion & reflection	Live (local)				X	X
Final discussion	Live (local site)	X				
Wrap-up & conclusion	Live (local site)	X	X	X	X	X

CABLE TV/PUBLIC ACCESS

The cable television industry has undergone many changes over the past several years as a result of deregulation by the Federal Communications Commission (FCC). Most cable companies provide cable TV services to educational and governmental institutions within their local communities. Cooperative use of channel space for instructional programs, such as Extension training, is often available. Households receiving cable TV are increasing in number and, because of the large number of available channels, programs can be targeted to a specific audience. Dedicated cable channels to distribute instructional television (ITV) also exist on most cable systems. Cable companies are important partners in the development of two-way interactive television systems. Cable overlash, use of tower space and switching capability often provide a cost-effective means of linking Extension educators.

Public access television allows Extension educators to use these local cable TV outlets, often without cost. The cable company provides studio and editing facilities and makes broadcast time available. The specialist can present any number of ideas he/she may find necessary to share with his/her clientele. The public access system provides a constant, stable outlet in a community. Programs may be presented and repeated for weeks or months at a time. The public access system also provides training for Extension staff members in the use of technical equipment and editing procedures. For those individuals who want to learn or improve these skills, public access will provide cable staff members to help and monitor as needed.

PRERECORDED VIDEO

The number of prerecorded videos available to Extension staff members is growing. Sources include national clearinghouses, federal agencies and associations. University outreach catalogs maintain an extensive listing of current titles in all areas of agricultural education. A specialist may want to show a videocassette on a VCR or have copies made for his/her audience. Some may provide multiple copies to various groups that have a special interest in a subject area, such as agricultural marketing. An excellent resource for Michigan Extension personnel is the AEE Resource Center, which catalogs a number of these prerecorded programs.

INTERACTIVE VIDEO

Extension specialists are simulating the traditional classroom environment by linking two or more educational facilities with two-way audio/video and data exchange capability. Most two-way interactive networks utilize a combination of microwave, coaxial cable and fiber optic technology, and benefit from cooperative arrangements with local cable systems and other service providers. Feasibility and engineering studies have been involving schools, colleges and universities. Projects throughout the state are in various stages of development. Experiments in distance learning provide for interactive classroom sharing among educational institutions facing tight budgets, low enrollments, and the need to improve and expand educational offerings. Two-way interactive systems have the most potential for success when supported by multiple applications and technologies, and strong partnerships.

BROADCAST TELEVISION

Commercial television stations provide limited programing in agriculture and Extension areas, though some public service and regular news programs do in-depth reporting on selected topics. Extension staff members, particularly CEDs, should become familiar with their local television station managers and news directors. These individuals provide direct links to opportunities to reach millions of viewers in the state. Public television stations also broadcast college credit programs or telecourses in cooperation with higher education institutions. Broadcast television reaches a large audience and allows for videotaping by educational institutions. Public television established the base of experience for the use of television for teaching in colleges and universities.

FIBER OPTICS

Fiber optic technology is the emerging electronic highway of the future for transmitting data, audio and video. Fiber lines allow for the high speed transmission of digital signals over a light wave through hair-thin glass filaments. The capacity of a fiber optic line is several thousand times greater than that of copper wire, and fiber optic technology is being used extensively today. Companies such as Michigan Bell, GTE, Sprint and other telecommunications providers have deployed more than 150,000 miles of fiber optic cable in the state so far. Currently, less than 1 percent of it is being used to deliver instruction. Two-way voice and audio interaction is possible with fiber optic technology.

APPENDIX C
GLOSSARY OF SELECTED TERMS

BIRD: Jargon for any satellite.

BROADCAST: In the context of videoconferencing, this term refers to those portions of a conference that are used for one-way (non-interactive) communication. A videoconference might begin with a one-way video segment followed by an interactive question-and-answer period involving questions from remote sites.

CABLE TELEVISION: The distribution of broadcast, satellite and other signals via coaxial cable; a rapidly growing industry. Most cable systems have the potential for two-way communications.

CLOSED-CIRCUIT TELEVISION: A system of transmitting TV signals in which the receiving and originating equipment are linked by cable, microwave, satellite, etc., without broadcasting to the general public.

COAXIAL CABLE: A high-frequency telephone, telegraph and television transmission cable consisting of a conducting outer metal tube enclosing and insulated from a central conducting core.

DIGITAL TRANSMISSION: A signal that has a limited number of discrete states prior to transmission -- that is, the signal is either turned on or turned off.

DISH: A shorthand term for the saucer-shaped antenna systems used in satellite communications.

DISTANCE LEARNING: A network that permits interactive instructional or training services to be transmitted from a central site. Educational information is sent via electronic delivery systems that link the central site to any number of remote sites.

DOWNLINK: The earth-station function at the receiving end of a satellite transmission system.

EDUCATIONAL TELEVISION (ETV): Non-commercial television primarily devoted to educational broadcasting. Also known as instructional television (ITV).

FIBER OPTICS: Hair-thin, flexible glass or plastic rods that use light signals to transmit audio, video and data. Fiber optic cable has a much higher capacity than traditional copper or coaxial cable and is not as subject to signal loss from interference.

NETWORK: (a) Broadcast network: television carried on a national basis by many stations that receive and telecast programing from a single point. (b) Private network: a number of locations that receive television programing by cable, microwave, videocassette, satellite, etc.

PAY-TV: A system of television in which scrambled signals are unscrambled at the subscriber's television set with a decoder that responds upon payment for each program. Also refers to a system in which subscribers pay an extra fee for access to special channels.

PBS: Public Broadcasting Service.

POSTPRODUCTION: In videoconferencing, this usually refers to editing the tape of the videoconference for a client's special purposes. It can also include the addition of music or narration.

PREPRODUCTION: Refers to all production activities prior to the videoconference; is often used specifically to denote the taping of segments to be inserted in the event itself.

SITE: A common term for a teleconference sending or receiving location. It can be either a permanent or a temporary facility.

TELECONFERENCING: The electronic connection of three or more people in two or more locations.

TWO-WAY INTERACTIVE TELEVISION: A communications system that links remote sites with one another, allowing a simultaneous exchange of voice, video and data transmission. Participants in a videoconference see each other in real time over the system.

UHF: Ultra high frequency; television transmission channels above Channel 13.

UPLINK: The earth-station function at a sending site. The term also denotes the facilities themselves.

VHF: Very high frequency, the range of frequencies extending from 30 to 300 megahertz; this range includes television transmission channels 2 through 13.

VIDEOCONFERENCING: The electronic connection of a number of receiving sites to one broadcast site for a special meeting. The system involves one-way video, often by means of a satellite transmission system, combined with two-way audio connections. The return audio is usually accomplished via telephone.

VIDEO DISK: A phonograph record-like disk that can store video (picture) information in digital format. It's useful for instant playback, slow motion and freeze frame displays.

VIDEO PHONE: A telephone combined with a video screen, allowing callers to see each other as they speak.

VIDEOTAPE: A plastic, iron oxide-coated tape of various widths (from 1/4 to 2 inches) for recording video and audio signals and additional technical code information.

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