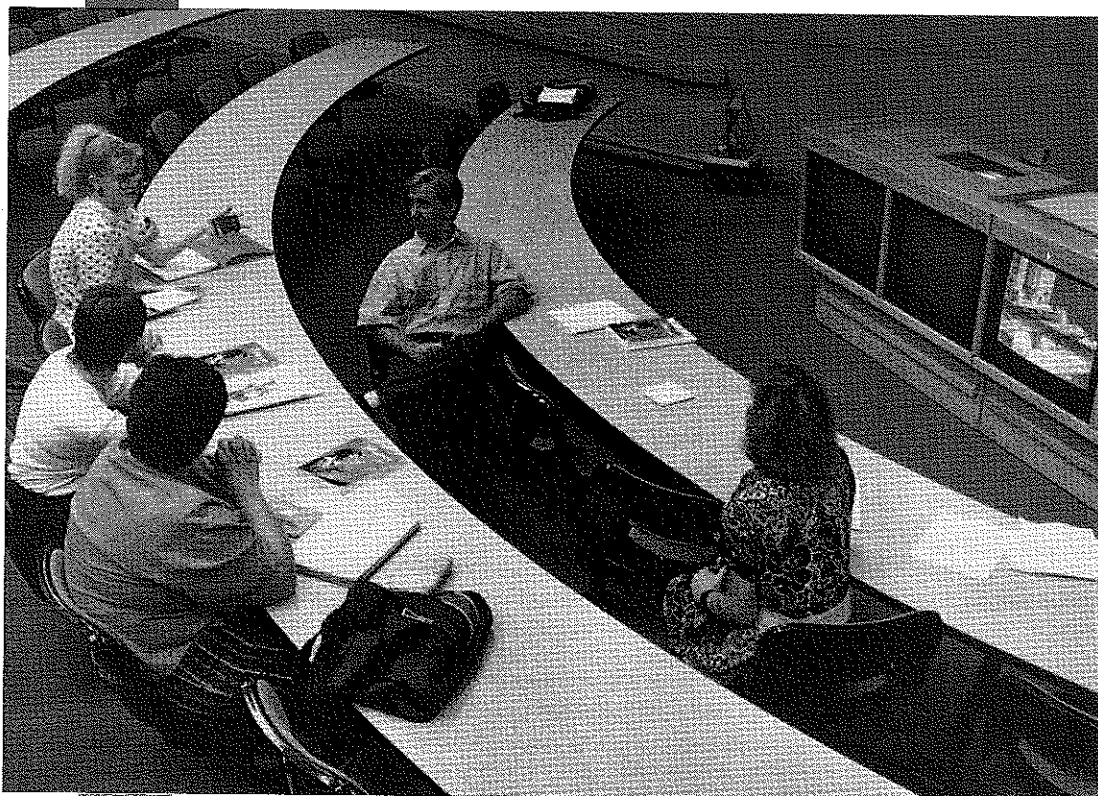


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Agricultural Education

February, 1994
Volume 66, number 8



Distance Education

Distance Education Programs

Preparing to Teach

Research Reports On Distance Education

THE AGRICULTURAL EDUCATION MAGAZINE



February, 1994

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Gains and Tradeoffs



BY ED OSBORNE

Dr. Osborne is associate professor and program chair of agricultural education at the University of Illinois, Urbana-Champaign.

In the past few years, agricultural education has moved further into the distance education arena. As the technology becomes more affordable and advantageous, and agricultural educators develop expertise with the delivery medium, we will surely see expanded use of distance learning approaches in agricultural education. But before we plunge too deeply into distance education, we may be well advised to consider the benefits and tradeoffs of this technology-driven method of delivering agricultural education.

Since distance education physically separates the educator and the learner, it has the obvious advantage of taking instruction to learners in remote sites. "Remote" can mean anything from 30 minutes to many hours away from the delivery site. Having taught several courses over our two-way audio system known as TeleNet, I have seen firsthand the advantages that distance education can offer. From the teacher's standpoint, distance education allows courses to be offered that might otherwise be cancelled, due to lack of enrollment. Distance education allows faculty to provide formal course work to off-campus students who may otherwise not enroll. From this angle, distance education keeps the academic program visible and active throughout a larger geographical area.

Distance education affords similar advantages to students. Students accept the shortcomings of distance education, because they clearly recognize its advantages in terms of time and money savings. For example, with distance education programming, teachers who live hours from campus can now enroll in courses and workshops immediately after school, and maybe not even leave their school or home to do so. However, video capabilities still require learners to assemble in selected locations away from the delivery site. The biggest advantage to students is the accessibility to agricultural education programs and courses that otherwise would not be accessible.

But distance education also has its tradeoffs. As suggested earlier, current audio/video technology does not enable educators to replicate the teaching and learning environments in place when effective, in-person teaching is provided. Isolation and intimidation by the technology are likely to compromise learning in the pro-

gram/course to some degree. In many cases, instructional methods are also limited by the technology, although creative instructors can do amazing things to compensate for this shortcoming. Perhaps the biggest tradeoff is instructors' inability to continuously obtain nonverbal feedback from their learners during the session. When video capabilities are absent, this becomes an even greater limitation. In fact, unless instructors have learners constantly engaged in dialog (which is neither feasible nor practical), students may become disengaged from the learning process, or even leave the session.

Adapting key principles of teaching and learning to distance education offerings is an especially challenging task for instructors. Using inquiry learning methods, keeping students active and motivated, providing organization and structure to the session, and other principles are crucial to any learning event. Distance education technology naturally supports some of these principles, while making others more difficult to apply. Informal feedback suggests that students prefer face-to-face interactions with their instructors. The impact of physically remote teacher/student interactions, if any, is an area of research that must be aggressively pursued.

Many more gains and tradeoffs can be cited for distance education as a delivery method in agricultural education. But there remains some hard questions with regard to when and how to implement distance education offerings. Should distance education ever be used to replace on-site educational offerings? If so, under what circumstances? What will be the impact of distance education on programs and staff in various institutions? If institution A offers a given course using distance education approaches that institution B has regularly offered, should institution B participate in institution A's offering? If so, to what extent? What should be the policies regarding instructors and/or facilitators at receiving sites? How should these instructors be compensated for their time? When should a distance-taught course be used instead of an on-site course? When are regional degree programs justified/warranted? If regional degree programs are established, what will be the impact on programs and staff at the receiving

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The Next Best Thing to Being There



BY M. SUSIE WHITTINGTON

Dr. Whittington is an assistant professor of agricultural education at the University of Idaho, Moscow.

Introduction

A student enrolled at the University of Idaho no longer merely has to wish to attend a class offered at The Ohio State University, Oklahoma State University, or Penn State. For the past two years, communication technology has enabled students in Idaho to enroll in courses at other universities. Students across the country are experiencing "the next best thing to being there" — education from a distance.

That's what distance education is all about. In some instances, it is an opportunity for instructors to carry information and expertise to students without physically going to the students — an idea rarely considered just a few years ago. In other situations, it is an opportunity for the instructor to be on-site while bringing information and expertise to the classroom from across the nation or around the world.

Is There a Need For Distance Education?

In every state, students welcome classes that instructors hand-carry to their geographic area. Master's degree students, such as secondary instructors fulfilling extended contracts, may not have the time or the resources to travel to and stay on campus for a course, but they can and will downlink a satellite course. Undergraduates, who may be "sitting out" a term to earn college money and cannot be on campus, may be excited about a class via the computer or satellite.

As budgets tighten and departments downsize, states could utilize each other's strengths and expertise to bring "boundaryless", quality education to students. If dollars spent for student and instructor travel can be decreased, if the miles between students and instructors can be shortened, both without shortchanging the quality of education, does the profession have a choice regarding the use of communications technology?

What Problems Are Associated With Distance Education?

Obviously, the problems associated with distance education are different for the instructors preparing courses as opposed to the students receiving courses. Are instructors spending the necessary hours preparing to deliver courses across distance — writing out plans that are suitable for teleprompts, rehearsing in the stu-

dio surrounded by monitors and cameras, rethinking and recreating visual aids? Are instructors spending the valuable time needed with technicians, gaining confidence in themselves, the technician, and the system? Are the instructors as effective as possible for the dollars spent on studio time and air time?

Is there a problem with instructors' attitudes toward distance education? Are potential distance educators paralyzed by the uncertainty of new technology or by a perceived lack of tangible and intangible rewards for their efforts?

Are students receiving the interesting and enthusiastic presentations they have come to expect from TV (thanks to the sounds of MTV, the action of ESPN, and the entertainment of HBO)? Can students at distant sites accept the lack of spontaneity and delay of interaction associated with physical separation from the instructor?

Instructors have expressed concern for the "distant class", but what about the problems for the "studio class"? I thought about the studio class when two campus photographers took pictures in my classroom while I was teaching. The distraction to me and to my students certainly paralleled (but on a smaller scale) the confusion of a studio during a live telecast of a course; technicians, cameras, lights, microphones, telephones, fax machines, and teleprompts are not the normal mode of operation in classrooms. How can these distractions be removed for the studio class?

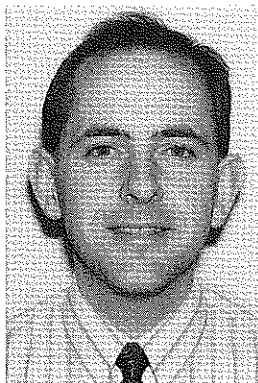
What Types of Distance Education Are Available?

When we think of distance education, a picture of a satellite dish or an image of students watching a television monitor might come to mind. Distance education, however, can consist of Computer Mediated Instruction (CMI), designed to allow students to engage in courses from a home-based computer system. Is this a viable option for students in agricultural education?

The AgEd Network is an example of this type of distance education. This system has been available for several years. Is the profession using it to its fullest extent? What are the implications for bringing national and international agricultural events to classrooms via the AgEd Network? Are there additional types of distance education that the profession should be considering?

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Taking the Distance Out of Distance Education



BY GREG MILLER & JILL KING

Dr. Miller is an assistant professor and Ms. King is a graduate student in agricultural and extension education at Iowa State University, Ames.

Smith and Stroud (1982) described distance education as the most significant development in education since World War II. Agricultural educators have only recently become interested in distance education, but the level of interest is increasing at a rapid pace. What is distance education? How is distance education being used by colleges and universities? What are the applications of distance education to secondary agriculture programs? How can you take advantage of the educational opportunities that distance education affords? This article will explore potential answers to these questions.

What is Distance Education?

Keegan identified four essential elements of a distance education program (Wilson, 1991). The four elements include: (1) the separation of teacher and student during most of the instructional process, (2) the influence of an educational organization and the provision for student evaluation, (3) the use of educational media to carry the course content, and (4) provision for two-way communication. At the most basic level, distance education takes place when physical distance separates the teacher and student, and technology (i.e., voice, video, data, and print) is used to bridge the instructional gap (Willis, 1993). If the separation or distance is removed, distance education closely resembles "traditional" education.

Colleges and Universities

As of April 1992, there were 11 universities in the United States that offered distance education programs. Most of the degrees offered through these programs were at the master's and Ph.D. level. The majority of the universities offered study in agricultural education, adult education, higher education, instructional systems design, and technology education (Dillon, 1992).

Distance education programs in fields other than education exist and are expanding. For example, the College of Agriculture at Iowa State University began offering an off-campus Master of Agriculture degree in 1979 and began offering an off-campus Bachelor of Science degree in 1991 (Miller & Honeyman, 1993). Since their inception, the programs at Iowa State University have awarded 50 master's and five bachelor's degrees. In 1992,

approximately 600 students enrolled in one or more off-campus agriculture courses, most of which were delivered by videotape.

Secondary Uses

Many teachers at the secondary level may be unfamiliar with distance education. This may be due, in part, to the fact that until recently, distance education programs were developed for adult learners. Also, distance education has been viewed as a creation of colleges and universities. Even so, distance education has found its way into secondary schools, and educators are beginning to explore potential uses for this new educational tool. As developments are made in communication technology and distance teaching methods are refined, their use will grow among secondary agricultural educators. Cable television, satellite communications, fiber optics, instructional television services, electronic blackboards, videocassette and videodisc systems, microprocessing systems, and teleconferencing, are some of the technologies currently being developed, installed, and operated in educational settings.

At the most basic level, distance education takes place when physical distance separates the teacher and student, and technology is used to bridge the instructional gap.

How can secondary agriculture teachers take advantage of the opportunities afforded them by distance education? You may find it useful to consider (1) taking courses and workshops offered through distance education delivery systems, (2) offering courses and workshops to distant sites, (3) receiving courses from distant sites for secondary students, and (4) keeping yourself and your program current.

Professional Development

Have you considered earning a graduate degree? Besides improving professional competence, advanced degrees are a major factor in increasing your income. Universities are currently offering degree programs to students who cannot or choose not to enroll in "traditional" on-campus degree programs. Earning a degree at a distance may offer you some →

advantages, including flexibility, self-pacing, and a reduction in the need to travel. Furthermore, the degrees of distance learners are gaining acceptance, and cost-benefit analyses favor distance education, since participants can maintain their jobs and continue to contribute to the economy (Clark and Verduin, 1989).

Maybe you are not interested in receiving a degree. Distance education may still have something to offer you. All of us need to take advantage of professional development activities. Agricultural educators need periodic inservice on technical agriculture topics, in addition to SAE and FFA program development. In the future, more professional development activities will likely be offered through advanced communications technology. In the future, there may be no need for you to travel 100 or more miles to attend a district meeting.

Offering Courses

Many of you are making innovative changes in the curricula of your local programs. What units are you teaching that may be of interest to a wider audience of teachers and students? Perhaps you could develop videotapes along with accompanying materials to share with other agriculture teachers. Many states are developing interactive communications networks that will allow teachers to teach students locally, while simultaneously offering the course to students in other schools. With the interactive systems, you can see and talk to students at the distant site.

If you decide to offer a course or workshop at a distance, always keep the interest of the student in mind. Many teachers who use television become too concerned with their appearance and performance. They become preoccupied with preparing a "slick presentation" and forget the most important consideration — the student. Knowing who your students are and what their needs are as learners is just as important in the distant setting. You should do whatever possible to "take the distance out of distance education."

Receiving Courses

Imagine the possibility of you and your students being able to interact with and learn from students and teachers hundreds of miles away. Many subject matter areas you have been unable to teach, due to a lack of facilities or expertise, would now be possible. The content of your program could be guided by student needs and not limited by locally available resources.

Most of us are aware of teachers who are doing an excellent job of teaching a particular agriculture topic. For example, many teachers are integrating aquaculture into their programs. If you and your students are particularly interested in learning about aquaculture, you probably could tap into the expertise of another

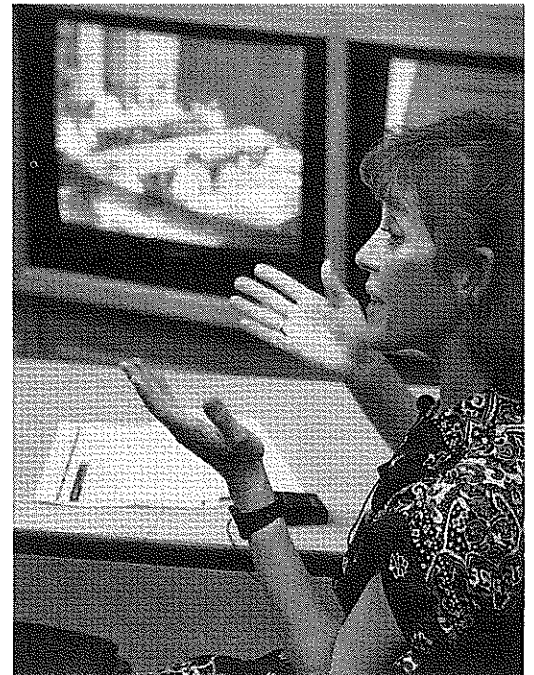


Photo courtesy of Linda Anthis.

teacher in your state or in another state. Perhaps, some type of collaborative agreement between you and the other teacher could be arranged to facilitate the sharing of resources and expertise. Distance learning technologies may provide the vehicle for delivering such an exchange.

Keeping Current

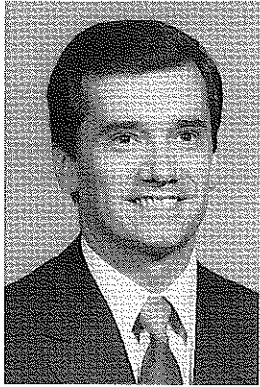
We owe it to our students to remain current and to keep our programs relevant to their interests and goals. Distance learning technologies will make it easier for you to access the resources that you will need to place your program on the cutting edge. You need to be on the cutting edge as well. You should lead the way in implementing and using distance education in your local school. Agricultural educators have often led the way in the improvement of teaching and learning. Developing and using distance education technologies should be no exception.

Conclusion

Now is the time to get on board. You should take advantage of workshops and short courses to learn more about distance education. Read material on distance teaching and learning. Information on the subject is widely available, and more information regarding the application of distance education to agriculture is being developed daily. Participate in distance education as a student and as a teacher. And share your experience with other agricultural educators. Agricultural educators have an opportunity to lead the way in "taking the distance out of distance education."

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Preparing A Course For Distance Delivery



BY L.H. NEWCOMB

Dr. Newcomb is associate dean and director of academic affairs in the College of Agriculture at The Ohio State University, Columbus.

Technological advances make it increasingly more feasible for us to provide education which is not distance bound. Currently, a consortium of colleges of agriculture, called AG*SAT, is providing some outstanding programs, especially to the higher education in agriculture system in America. I've had the pleasure of teaching a course on college teaching in agriculture via this technology and found it to be a stimulating experience. We were able to reach students in ten different universities simultaneously.

Soon, local high school teachers should be offering some advanced placement agricultural instruction to high school students throughout the country. They should also plan and teach highly specialized classes that can meet the needs of small numbers of students in classes in many states. Another opportunity is to offer specialty topics that many local teachers could incorporate into their regular classes. Inservice education for teachers of agriculture could also routinely be accomplished via distance delivery. There are a number of considerations involved in preparing a course for distance delivery.

Draw On The Principles Of Teaching And Learning

What works well in the normal classroom will generally work for distance delivery. In many senses, what we need to do to adequately prepare for distance delivery is to be sure that we have mastered the fundamentals for course delivery in a space and time-bound class.

Unless interaction is promoted in an aggressive fashion, students will tend to be passive learners and much of the power of distance learning will be lost.

While I suspect that all of the principles of learning should be drawn upon, there are several that deserve special mention. They are:

1. subject matter needs to possess meaning, organization and structure;
2. students must be ready and motivated to learn;
3. directed learning is more effective than undirected learning; and
4. students learn more when they inquire

into the subject matter, rather than when they are instructed in the subject matter.

Consider The Limitations Distance Imposes And What Your Knowledge Of Learning Suggests As The Appropriate Remedy

As you consider teaching students in a remote location, realize that they can see and hear you, but at best, with current technology, you will probably only be able to hear them.

Limitations that this imposes include:

- no visual feedback;
- lack of personal acquaintance;
- very limited non-verbal feedback;
- more difficulty in establishing rapport and trust;
- lack of spontaneous conferencing;
- inability to provide immediate and face-to-face reward; and
- more difficult to create a "personal" felt need to know.

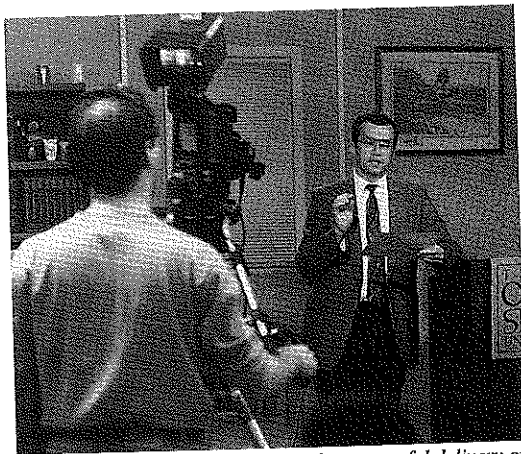
These limitations are very real, and most are unchangeable. However, if you will apply what you know about the principles of teaching and learning, you will be able to ameliorate some of these constraints.

My experience suggests that paying more attention than usual to the principle of learning that deals with organization and structure is essential. Given that you are not there to pick up verbal and non-verbal cues as to lack of clarity, it becomes exceedingly important to over-organize and over-structure each learning activity.

Having students at remote sites will also demand your best in terms of motivating those students. You will have to surely crank up your energy level as a part of your visual presentation. You will also have to structure the flow of knowledge in such a way that excellent use is made of rhetorical questions, and that other organizers are used which promote thinking on the part of students at distant sites.

I also suspect you will need to draw on your knowledge of various ways to reinforce desired behaviors of students at distant sites. In many cases, this can be effective only if you adequately anticipate in advance how you might be able to make various approaches to rewarding students work for you. →

Perhaps the greatest challenge is figuring out ways to cause students to believe that you believe in them. This will take a special effort and must be handled with care, lest it seem superficial and not genuine.



Technicians played a vital role in the successful delivery of "Methods of Teaching Agriculture" from The Ohio State University.

Special Considerations

Special consideration will need to be given to promoting interaction, providing personalization, changing pace, enhancing clarity, and other such tasks. Making learning aids or learning guides available in advance will be more important than in the normal classroom. You will also need to provide for special preparation and updating of local site coordinators. In addition, you will have to find ways to make yourself available to students.

Promoting Interaction

Unless interaction is promoted in an aggressive fashion, students will tend to be passive learners, and much of the power of distance learning will be lost. Generally, with current technology one is able to promote interaction by way of telephone and FAX. E-mail is also an option. However, that interaction will not occur if all the instructor does is make the telephone, and FAX line, and electronic mail connections available. Students will have to be nudged, encouraged, or even forced to use that interaction. The technology creates a powerful psychological barrier, and you will experience enormous resistance on the part of students at distant sites to truly make the effort to interact. My experience suggests that you have to have pre-arranged assignments that assure interaction. Students at distant sites need to know in advance that there is a question they should be prepared to answer, a task to which they need to be prepared to respond, or some other such activity. As instructor, you will need to call on people at each site. You will also need to use their names periodically, in a rhetorical fashion, so they feel connected and a part of it.

Personalizing The Course

It will be important to try to learn the names

of students and to use them. You will also want to find ways to make the students at the distant sites feel like they are a part of your immediate audience by having icons that represent the various sites present in the studio as visual reminders that there are many more involved in this learning activity than just those sitting in the studio. At each meeting, it is also important to try to involve students from all sites, if the number of sites permits such a strategy to be used.

Change Of Pace

With all effective instruction, we know we need to change the pace frequently, in order to maintain students' attention. With distance delivery, this is doubly important. The medium is television. The various audiences who are joining in for the class have thousands of hours of experience of viewing television. As the deliverer of distance education, you must compete with modern television techniques to the extent that your ability and resources will allow. It is simply deadly to try to provide uninterrupted straight lecture for an hour or two of distance delivery. There have to be many sharp breaks and contrasting approaches. You have to find ways to promote discussion and small group work at the various sites if you are going to have adequate change of pace.

Clarity

Clarity is one of the most enormous challenges facing the person delivering a course to distant sites. The level of clarity needed cannot be achieved without double the usual preparation and double the usual rehearsal. As the course is delivered, session by session, the teacher will need to review the tapes of his or her performance, so as to constantly improve on the need to provide clarity to those who are not in the room with the teacher.

Providing Learning Aids

Learning aids will be essential to the success of distance delivery. The students not only need a syllabus, they need detailed handouts and other paper-oriented guides in advance of every session. This will require much anticipation on the part of the person planning and delivering the course. The additional structure that is provided by written materials mailed at the beginning of the course will be central to its ability to successfully meet the needs of distant learners.

Preparation Of Site Coordinators

At each of the distant sites, you will need to have a site coordinator who is familiar with what you are trying to do and knows something about the subject matter you are delivering. There should be a conference telephone or satellite program for site coordinators before the course begins. This can help people become acquainted with one another and especially with the teacher. It also gives everyone a →

common overview of what the course will seek to accomplish.

Weekly, you as an instructor will need to provide information to site coordinators. They will need to know what it is you will try to accomplish during the upcoming session and what their role is expected to be. These weekly updates can be provided by FAX, E-mail, or telephone conferencing. They are essential, and the neglect of them will substantially reduce the effectiveness of the course.

Making Yourself Available

As instructor, you must make yourself available to the learners at the distant sites.

They will need to be able to contact you and clarify concepts, assignments, or other matters. Having an 800 telephone number available for them can be particularly useful. With this technique, you can then establish "office hours", so that they can be assured you will be available to handle their questions.

Prepare All Content In Advance

Preparation is more important with distance delivery than with a site-bound course. It is imperative that the syllabus, all lesson plans, visual aids, exercises, and hand-out materials, as well as tests and explanations of assignments, be developed long before the course is aired. These materials need to be provided to site coordinators and duplicated, so that each student can have the advantage of content guidance in a very systematic, session-by-session pattern of organization.

Practice

Preparation is not enough for distance delivery. You must actually rehearse. If this is the first time that you have taught via this medium, it will be important to become familiar with the studio, the equipment, and technology you will have to master. You will need to spend time making yourself comfortable with the microphone and the lighting. You will also need to practice using the teleprompt, if you want to provide a smooth delivery. Practice will also be needed in the area of handling overhead cameras, showing relia, giving demonstrations and using visual aids. You and the producer and technical crew will need to become acquainted with one another in a very special way, so that you can adequately anticipate how to handle the unforeseen. It is inevitable that phone lines will go down, teleprompts will malfunction, transmission signals will be lost, and other malades will occur. By working together as a coordinated team, you will be able to successfully handle all such challenges.

Stand And Deliver

If the course is prepared and you have rehearsed, then all you need to do is stand before the camera and deliver instruction in a confident and competent fashion. It will be

important to review and to reflect after each session so that you can continue to perfect your technique.

It will be essential that you invite ongoing input from the studio crew and site coordinators so that you can make week-to-week improvements. I also suggest interim evaluations from the students at the distant sites. With this technology, it is not advisable to wait until the end of the course to formally solicit input from learners.

If you have the opportunity to use this medium, it will be a marvelous experience for you. Indeed, it will cause you to stretch, to grow and to improve. ■

Gains and Tradeoffs . . .

(continued from page 3)

institutions? Will smaller programs be "put out of business"?

Distance education technology and methods hold exciting potential for reforming the delivery of agricultural education. On the one hand, people who otherwise might not participate in courses and seminars will be reached. On the other hand, the impact of distance education on the programs and staff at receiving (and delivering) institutions raises some important concerns. When should distance education programming be *supplementary* to traditional offerings, and when should it be *complementary* to traditional offerings? Our goal should be to use this technology to fill the gaps in our educational offerings, while strengthening existing efforts. If we keep this goal in mind, then agricultural education can fully embrace the educational opportunities afforded by distance education. ■

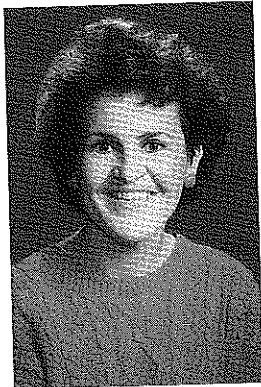
Taking the Distance Out . . .

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Team Teaching Via Two-Way Interactive Video



BY LAURIE STENBERG NICHOLS & BETTY LEA TROUT

Dr. Nichols is an assistant professor in the School of Family and Consumer Sciences at the University of Idaho and Dr. Trout is an associate professor at Washington State University, Pullman.

Team teaching can be a rewarding experience for instructors and students. To be highly effective, instructors must approach this experience with a true team orientation. The philosophy that "we are a team and we will plan and teach the course together" must prevail. Recognizing that team teaching will actually be *more* work than solo teaching is important. Adding distance delivery as one feature of the course adds yet another dimension and challenge. We'd like to tell you about our experiences and offer some suggestions in case you'd like to experiment yourself!

Our Experiment

Washington State University and the University of Idaho are located only seven miles apart from one another. As a result of this uniqueness, Betty Lea Trout, WSU, and Laurie Stenberg Nichols, UI, have cross-listed and team taught five courses together over the past five years. Students enroll in the class for either WSU or UI credit, but both professors plan and deliver the course as a team effort. The on-campus classes rotate each semester between meeting at WSU and UI, and commuting students can either drive or take the campus commuter bus, which runs between the two universities and is free of charge to faculty and students.

During two summers, two of these courses were also delivered via Washington State University's WHETS (Washington Higher Education Telecommunications System) and University of Idaho's Public Broadcast Microwave System to distant sites across the two states. Some of the distant sites included: Boise (Idaho), Spokane, Vancouver, and Richland, Washington. When we first began investigating the possibility of delivering our courses to distant sites in both states, we were met with skepticism, as no one had ever tried to tie the two very different technologies (satellite and microwave) together. However, when the combination of our persistence and the challenge presented to WSU and UI technicians finally won, we were told we would be an "experiment."

Lessons Learned About Team Teaching Distance Courses

Starting early is a key to making things work. We found that beginning the planning process one year in advance of the actual

course was optimal. This allowed us time to meet with the media specialists who were in charge of the distance technology and schedule the systems for the same time in both states. It also enabled us to secure the special classrooms or studios on our campuses, as well as classrooms at each of the distant sites. Advanced planning allowed us to meet catalog and time schedule printing deadlines at both universities and do publicity of our own at the branch campuses where the course would be downlinked.

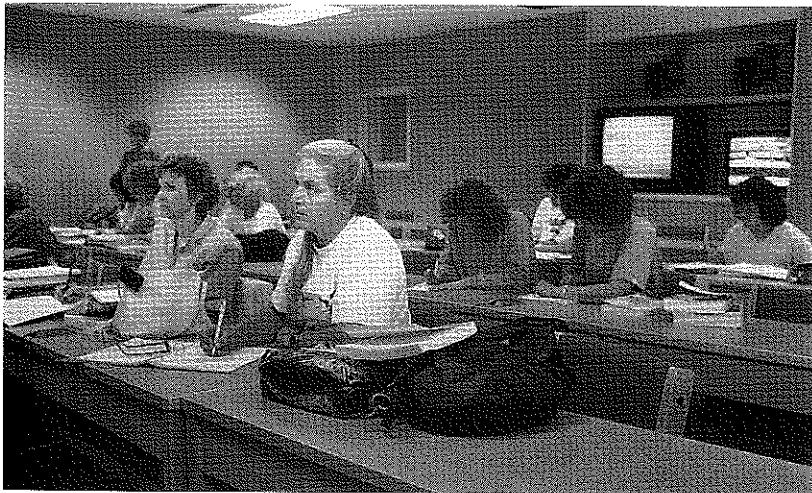
In addition to the technical aspects, we learned that team planning, from the very start, is essential to truly making this a *team teaching* experience, rather than just a shared teaching experience. We would begin scheduling weekly meetings several months prior to the start of the course. Our agendas evolved from brainstorming content of the course, to locating and ordering resources, to selecting text or readings. Eventually we would get to the point of preparing daily lesson plans. Although many times it would have been easier to divide tasks and do them independently, we avoided this temptation and instead met, working together as a team on all or nearly all planning.

Teaching strategies became a critical part to the success of our courses. Interestingly, we found that our various sites drew different types of learners. Our on-campus class tended to attract more traditional students with less life experiences, while the distant classrooms were made up of older adult learners with a wealth of experiences to share. You can imagine the differences in discussion levels as well as needs of learners! To account for these differences, we found a blend or integration of giving out information (lecture, multimedia, guest speakers, etc.) and sharing information/experiences (discussions, small group work, question/answer periods) was effective. Since our classes met for three hours per day, we would move from one technique to another every 30 to 45 minutes. With every change in technique, we as instructors, would also switch so that we took turns leading the class. The switch in leadership was also helpful to the students as they said the change in teaching style helped hold their attention. At times, we would both be in the front of the class, collaborating on a discussion. We found that the more integrated we were as teachers, the more of a team we presented →

to the class.

Visual aids take on an entirely new meaning when teaching over interactive video. No longer are transparencies necessary. Because the visual is projected over the monitor, regular paper is fine. However, print size must be enlarged; we were told to use nothing smaller than a 20-point (word processor) or approximately one-inch lettering, 12 lines or less per page. In addition, printing visuals on pastel paper is optimal, as white has a tendency to produce a glare under the camera and lights. Consequently, already existing visuals may need to be redone in proper format and on appropriate materials.

An added benefit to the multitude of sites is the expanded opportunity for resources. We were able to have guest speakers from Spokane, Vancouver, and Boise — something which would have been impossible had we been teaching a traditional classroom on the main campus.



Students participate in a class delivered via WHETS.

Barriers to Learning

Team teaching and distance learning do present barriers which must be overcome so that learning can occur. One barrier was the physical structure of the class studios. Classrooms were built theater style, with chairs permanently attached to the floor. Microphones are present at each desk and students must speak into the microphone for all sites to hear. The inflexibility of the room to move chairs into circles or other arrangements for discussion groups was very difficult for us and the students. In addition, when a student was speaking, they had to look straight ahead and speak into the microphone, rather than face the rest of the students. The awkwardness was evident many times.

Overcoming a fear or discomfort with the technology was important for all of us — teachers and students. Seeing oneself on the TV monitor can be startling and unnerving. Wearing a microphone and standing still is also

hard for some of us “roamers.” The camera has the ability to follow the instructor within a limited space, but it is not possible to move throughout the classroom as one might normally do.

Because not all of the students are physically in one site, any handout material must be at the site well in advance with directions as to timing of distribution. Spontaneous assignments or activities which require handouts are not possible. With the FAX, rapid transmission is easier, but not all classrooms are equipped with a FAX, so advance delivery must be considered. We tried to have all handouts copied before the start of the course and delivered in files for each student.

Some students who attended class at distant classrooms commented on feeling left out at times. They felt that they were not receiving the same benefits as the students who were on campus with the instructors. Once we became aware of this, we made very deliberate efforts to draw in distant sites and make them an important part of the class discussions and other activities. Some strategies we used to do so included giving each site unique assignments and having them report back to the whole class, making a deliberate effort to ask specific sites to comment, asking specific sites for questions, and even including fun activities, such as having each site draw a visual and share with us, so that they would have experiences of presenting on the technology to other sites. At first, many students were hesitant and we would find we had to give extra “wait time” or even coax them to respond. However, by the end, the technology did not appear to be much of a barrier at all. In one evaluation, a student commented, “This is the first telecommunications course that I’ve taken . . . I found it to be very exciting!” One other strategy which is important, but not always feasible, is for at least one of the instructors to visit each distant site for one of the classes.

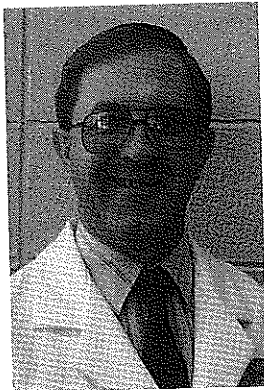
Working with technicians can be frustrating at times. Assertiveness is important if things are not going well. From time to time, the technicians would forget to move the camera onto the speaker, fail to focus in on the visual, delay the start of the video, or generally not pay attention to what was happening in the class. When this happened, it was important that we call this to their attention and ask for better technical assistance. We soon learned that having an excellent technician was a key for success!

Tips for Success

- Allow 6-12 months for lead time to schedule the telecommunications system, list the course in university catalog or time schedule, publicize the course in all site areas, and develop the course.

(continued on page 17)

Using the Ag Ed Network



BY BILL PEAL

Mr. Peal is an agriculture teacher at Pendleton High School, Pendleton, OR.

Today's agricultural education demands new approaches in teaching, as well as new directions for learning. How can agricultural educators best fulfill this increased level of expectation? One approach available to teachers who have access to a phone, a computer, and a modem consists of connecting to the world on a day-to-day basis. The problem of molding an innovative and challenging agriscience program which meets the changing needs of today's students is made a whole lot easier with the use of the Ag Ed Network.

The Ag Ed Network

America's first national, online education database, the Ag Ed Network, provides today's agriculture teachers with a direct link to information that puts them and their student in the know. This network is the result of a joint project of the National FFA and ARI Network Services. The current explosion in data which drives our agricultural industry is just too much for the traditional information dissemination system to handle.

The time required from discovery, to writing, to being published often makes information obsolete, or at best, second generation news. Today's agriculture teachers can connect to news sources as they happen. By so doing, they are able to deliver real-life education. Students have the opportunity to formulate their own opinions as they watch major events unfold and as they track the political process that propels policies and regulations. They can observe as other nations react to U.S. policies, while our leaders attempt to negotiate trade agreements favorable to the needs of the agricultural community.

The Ag Ed Network and FFA

Researching and writing speeches for the prepared and extemporaneous FFA contests is made much easier with this valuable connection to news and data, which are only hours old. A new report is prepared by the Ag Ed Network daily, outlining the key issues affecting agriculture and referring to more detailed stories for further research. (This report code is Ag1.) Student debate of current topics in parliamentary procedure is much stronger when they have used the analysis of key agricultural issues. Reports which you can access for this purpose are Ag7 and Ag8. Ag7 is a worksheet

of questions based upon the current issues which occurred the previous week in Ag1 reports. Ag8 includes the teacher's answer guide to these questions. This gives agriculture students an in-depth understanding of the crucial developments which drive the agricultural industry.

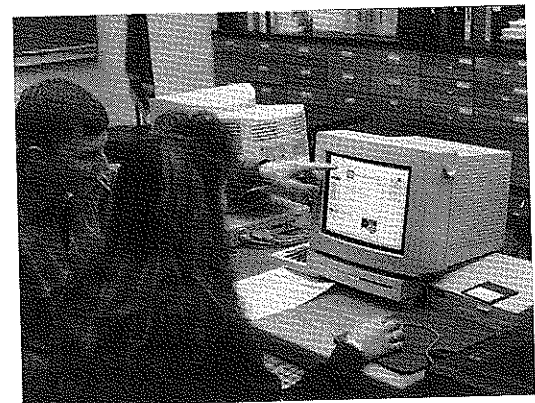
Preparation for National FFA Convention takes on new meaning when students are able to go on-line and receive monthly update information from the National FFA, detailing plans for speakers, workshops, and other special events.

A Resource for Teachers

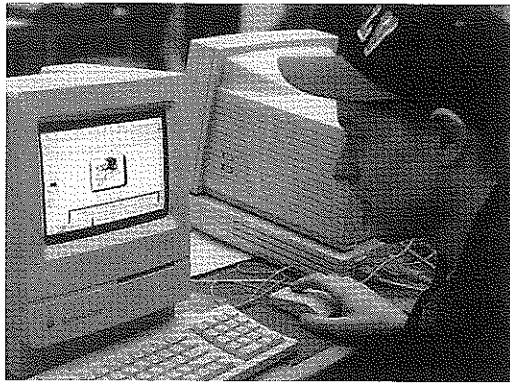
Teachers needing information on new areas of study have several state-developed curricula available, such as the Colorado, Oklahoma, Wisconsin, and California curricula. These have up-to-date lessons reflecting the new directions and emphasis of agriscience and agribusiness found in today's classrooms.

New ideas are always welcome when trying to implement such areas of instruction as agricultural sales and marketing. When given the chance to study something from the book, from a worksheet, or from the computer monitor, my students prefer the latter. I see students of low reading ability staying with a lesson on advertising, meeting the customer, or completing a resume with much more intensity when they go on-line and receive the information. On the other hand, those students of above average ability find no lack of information or challenge as they find new sources of information and many new ways to analyze their data.

The level of student motivation for →



Tom Munck works with Rachel Lorenzen to revise data from the Ag Ed Network to make a newsletter.



A student works with news from the National FFA regarding the National Convention.

making triads using the commodity challenge is very high when they are able to access the Chicago Board of Trade, and they can chart the market on a daily basis. All of a sudden, the students are making the connection between what Russia and other foreign governments are doing in foreign trade negotiations and how those actions are affecting their commodity. Natural disasters around the world have a different significance to students as they begin to realize that another nation's crop failure may cause the world markets to respond, thus changing the profitability of their commodi-

ties. Suddenly, agriculture in a world economy starts to make more "cents".

One of the real rewards of being an agriculture teacher is in the mutual support which we share and extend to each other in the profession. The use of e-mail is just one more way in which this communication is made possible. Leaving a message for another agriculture teacher and being able to send and receive files, lessons, or other documents is also a great advantage. In addition, the tracking of student competency credit and sending it to a regional database via modem allows for the eventual granting of college credit for several introductory courses at our local community college.

Summary

Yes, meeting the changing needs of today's students is indeed a challenge. If you are looking for a way to be innovative and to incorporate lots of ideas which show that you are truly on top of today's technology explosion, you might share in the support and knowledge offered by others in the field who have contributed to the Ag Ed Network. Use your ability to send and receive e-mail and help your students connect to the world. ■

Tips for Teachers

Using The Ag Ed Network In Class

Here are the major features of the Ag Ed Network and how to use them in an agriculture classroom.

Ag Ed Today (AG1)

This daily news summary is available to keep up with current agricultural events and to use for classroom discussion.

Weekly Issues For Discussion (AG7)

This weekly review of important events is presented in a set of thought-provoking questions and answers. Questions and discussion points used along with Ag Ed Today are provided to help students gain a better perspective of agricultural developments in three ways:

- Keep them aware of the important current agricultural events.
- Help them to understand the implications of events on farms and agribusinesses.
- Motivate them to follow and express their views on agricultural issues.

Using Ag Ed Network Lessons In The Classroom

1. Decide on the subject or the area of concentration to be taught. Select the appropriate lessons and reports from the index.
2. Review the objective of each lesson to be sure it is appropriate for the subject you will teach before accessing the complete lesson.
3. Decide which lesson(s) are best suited for the specific areas you wish to cover and pull off both the student (HS prefix) and teacher (HT prefix) versions. The lessons can be downloaded and stored on a disk for later reformatting and/or printing, or they can be printed out immediately for photocopying.
4. Examine the teacher version and follow the suggested steps for preparation, noting the AgriScan reports needed to enhance the lesson. Prior to class time, pull off current AgriScan reports so the lesson becomes a "truly live" experience.

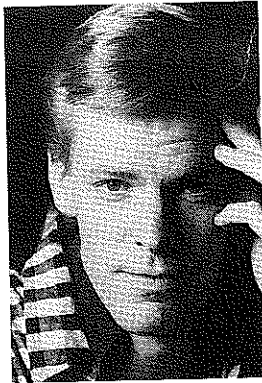
Applying AgriScan To The Classroom

PRICES AND ADVISORIES SERVICES — AgriData and Ag Ed Network are especially useful when teaching the complex world of marketing agricultural products. Many teachers have their students "paper trade" commodities of interest to help them develop an understanding of how the markets work and the factors that affect them. They access prices daily to track price movement and check advisory services to help plan strategies.

Here are other activities and projects that make use of Ag Ed Network as a teaching tool.

- Give students a set amount of grain and/or livestock and have them "sell" it over a 3-month period.
- Make students buy or sell a futures or options contract on paper and follow it to see how much they would have made or lost.
- Have students construct a bar chart and then write down the factor(s) that made the market move.
- Assign students to write up a market advisory newsletter for the next week, then see how close they come to being accurate.
- Prepare budgets using the price information on the network.
- Construct a basis chart for different elevators or terminals in your area.
- Using Ag Ed Today and other news items, have students write copy for a radio program and then read the copy.
- Have students make up a small farm newspaper.

A Student's Perspective



BY RICK SCHOELLHORN

Mr. Schoellhorn is a graduate research assistant in agricultural and extension education at the University of Florida, Gainesville.

When I enrolled in a recent satellite course offered by the Agricultural and Extension Education department here at the University of Florida, I was looking for information I could use to improve my teaching skills. I knew the course was a prototype, which could possibly have some problems, but it came highly recommended; and I felt strongly that any input was good for a graduate student with limited teaching experience. The course, as it turned out, was excellent. Any problems that occurred were small in comparison to the information and insight the course provided.

Technology and the Instructor

In order for any course to be a success, it requires a committed instructor who is willing to put up with some technological glitches and setbacks. Dr. L.H. Newcomb of Ohio State was really all I could have hoped for in a "canned" instructor. I have only taught enough classes in my time to realize how difficult it can be to keep a lecture on track when the overhead projector malfunctions. Multiply the amount of technology I was faced with by a factor of 100, and you may have an idea of the complexity of operations Dr. Newcomb was faced with while managing to pull off a live satellite course.

Technological problems for an entire semester amounted to losing satellite contact two times, and all students love an unplanned day off, so this was not a problem. The picture was grainy on one or two occasions, but usually it was a matter of focusing the reception at our end of the broadcast.

Making It Work

I was impressed with how professionally the show was produced. In a normal classroom setting, you can take your students through a handout, an overhead, and possibly a slide presentation, but usually not all of these in a one-hour lecture. The type of lectures Dr. Newcomb gave in this course involved moving from one type of medium to another frequently. Summaries of key points were brought up in text while Dr. Newcomb's live voice continued at a conversational pace. Videos of other instructors were used as examples of good technique. Camera shots involving Dr. Newcomb writing, moving about the classroom, talking to students, and close-ups of students responding to his questions were all edited so that the transitions appeared to be very fluid. In all, both

technologically and creatively, the video broadcast ran very smoothly. It is a credit to the expertise of the filming crew and Dr. Newcomb's organization, that a lecture with so many complications we normally don't face in the classroom created an image of just that, a normal classroom situation.

Students at the various locations where broadcasts occurred interacted with Dr. Newcomb via phone lines set up for the class. Although it is awkward to communicate this way, it was the only realistic method of getting interaction at all. I think that very likely the awkwardness of reaching the instructor this way reduced the number of questions asked at all locations. It can be difficult enough to get students to brave their peers and ask questions while you stand at the front of the class; it only becomes more intimidating for a student to stand and walk to the back of the class and speak on the phone, while most of the class watches.

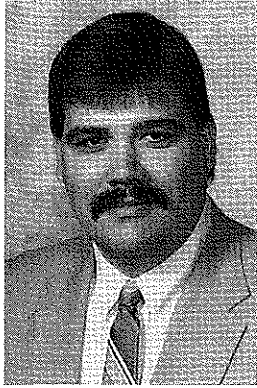
In terms of homework or written assignments, the class handed material in to our "live" instructor, Dr. Max McGhee, who relayed the papers to Ohio and had them returned with Dr. Newcomb's comments the following week. In this respect, there really was no difference from a course that meets once weekly without satellite broadcast. Communication problems occurred when written comments or letters were faxed to Ohio. Though it was a little frustrating, it didn't affect my enjoyment of the class.

At the close of each broadcast and occasionally during broadcasts, we would have group discussions, led by Dr. McGhee, of the topics addressed each week. In my opinion, these were potentially the best learning experiences the class offered. As professional as the production was, there is no substitute for a flesh and blood instructor. Too many of the nuances of a dynamic classroom situation rely on time frames, sometimes seconds, that you really can't address via satellite. A television can provide visual stimulation, offer insights and instruction, and challenge you with ideas; but for myself, there is a chemistry in the interaction that occurs between two people that kicks any learning process into high gear.

Other Insights

Courses on improving teaching skills bring up some interesting responses from a classroom
(continued on page 17)

Incentives for Planning and Delivering Agricultural Distance Education



BY GARY JACKSON

Dr. Jackson is an assistant professor of agricultural education at Mississippi State University, MS.

According to the *Appalachia* (1992), 95% of all learning institutions will use distance learning to provide educational services by 1995. Many agricultural institutions and organizations have already begun to develop and deliver distance education programs and courses using telecommunications technology. The Agricultural Satellite Corporation (AG*SAT) is a consortium of 48 land-grant universities and governmental organizations established to conduct an agricultural information and instructional service through advanced telecommunications. AG*SAT transmits agricultural programs across university and community settings using satellites and other technologies (AG*SAT, 1990). Many universities participating in AG*SAT list satellite courses as a part of their curricula. AG*SAT instructors are also considered visiting professors at each university where their course is downlinked (Benedetti, 1992).

Faculty Participation in Distance Education

AG*SAT's major contributions have been to broadcast televised courses and programs, broaden agricultural curricula, and provide educational materials that would otherwise not be available. Many of the educational programs are being delivered by College of Agricultural Sciences faculty. However, Randy Bretz (1992), Assistant Director and Program Manager of AG*SAT, has indicated that more instructional hours and faculty are needed to produce additional distance education programs to be delivered on the AG*SAT network. Carl (1986) indicated that faculty are the key to providing students with a spontaneous, responsive experience in distance education. However, faculty participation has been limited because of the lack of incentives, poor attitudes toward distance education, and required changes in instructional methodology (Dillon, 1989). Many faculty in colleges of agricultural sciences will not become involved in distance education programming because there are no rewards for promotion and tenure, inadequate time to prepare a course, or few available faculty development programs for telecommunications programming on their campus. Faculty may also fear teaching on camera or relinquishing some control over the teaching and learning process. Moore (1991, p. 1-2) indicated that while administrators, teachers, and policymak-

ers increasingly turn to affordable devices such as computers, satellite transmitters/receivers, and audio graphic systems, "... many have not yet appreciated the consequences for program design, instruction, and organization of using these media."

Incentives For Participation

In a recent agricultural distance education study (Jackson, 1993), a modified Delphi technique was used to generate incentives that were included in a conceptual model that will enable faculty to plan and deliver an agricultural distance education course or program. A Delphi panel of experts consisted of 20 agricultural sciences faculty and extension educators from 42 universities, who have planned and delivered televised credit and noncredit distance education courses and programs via the AG*SAT network. They responded to a series of questionnaires containing questions and statements related to incentives that encourage agricultural faculty to become involved in planning and delivering distance education courses and programs. The panel of experts identified five incentives that encouraged them to plan and deliver an agricultural distance education course or program. These included: 1) additional use of the instructional materials other than for the course or program that is delivered via satellite, 2) the delivery of instruction more efficiently, 3) an efficient way for me to reach larger audiences, 4) the opportunity provided to increase public interest in a topic, and 5) efficiently meet public requests for information. They further indicated that the most important incentive was "an efficient way to reach larger audiences."

Panelists also identified six incentives that they believe will encourage other agricultural faculty to get involved in planning and delivering distance education courses and programs using satellite technology. These incentives include: 1) recognition from administrators, peers, and clientele, 2) availability of funds to produce courses, 3) opportunities to reach more people, 4) widespread demand shown for a particular topic, 5) adequate support staff to produce courses, and 6) the time to plan and deliver a course or program. The opportunity to reach more people and widespread interest in a particular topic were the most important incentives. →

The incentives identified were divided into two categories: actual inputs required and anticipated outcomes. The actual inputs required are those incentives that are necessary to begin the course or program planning process, which should be supplied by educational institutions and public demand. The anticipated outcomes are those incentives that are rewards from effectively planning and delivering a course or program. These incentives should eliminate the potential barriers related to effectively planning and delivering agricultural distance education courses and programs, such as obtaining the necessary funding and time required to produce a course or program. Figure 1 identifies these incentives that will encourage agricultural faculty to plan and deliver distance education courses or programs.

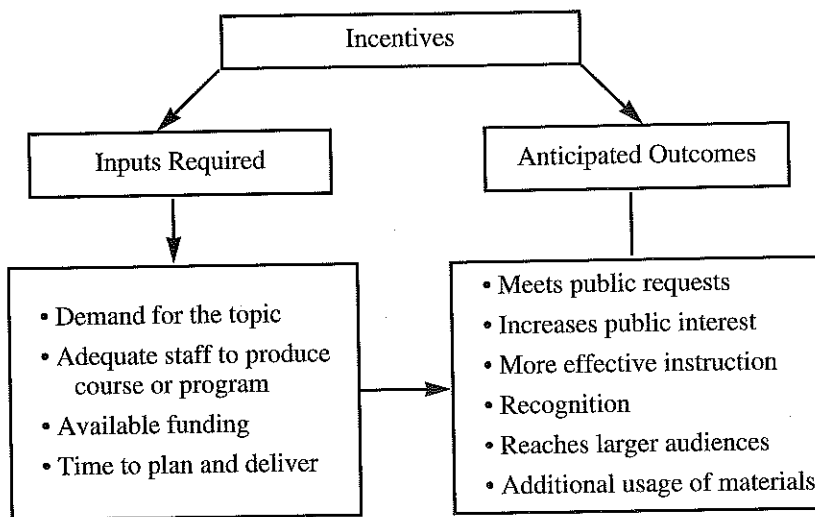


Figure 1. A Flow Chart of the Incentives That Will Encourage Agricultural Faculty to Plan and Deliver Distance Education Courses or Programs.

Summary

Dillon (1989) indicated that faculty participation in distance education will continue to be limited because of lack of incentives. However, the potential for agricultural instruction and programming through distance education is tremendous. Simerly (1990) found that agricultural sciences faculty are interested in gaining new knowledge and skills which will enable them to be more effective in teaching, as well as in research and community service. Distance education has evolved from individual student correspondence study to telecommunications modes of instruction, utilizing video and audio teleconferencing. This evolution is changing the way faculty teach and disseminate information to the public and provides educational institutions with the ability to deliver high quality programs that meet the contemporary needs of society.

Newcomb (1992) suggested that technology is ready, but agricultural distance education will not reach its potential until faculty are as ready as the technology. To increase faculty participation in distance education, universities,

colleges of agricultural sciences, educational administrators, promotion and tenure committees, agricultural businesses and corporations, and other professional agencies and organizations must provide the necessary incentives needed to encourage agricultural faculty to plan and deliver distance education courses and programs.

DeLoughry (1992) indicated in *The Chronicle of Higher Education* that university and college administrators are being urged by various groups to help expand the use of technology on college campuses. Newcomb (1992) also indicated that agricultural departments must include the option of sharing their courses and programs among institutions via satellite delivery of instruction. With this rapidly changing technology, educators will be expected to disseminate extensive amounts of information being produced. They will also be expected to expand their resident classrooms and information centers to larger and more diverse audiences, which will also include secondary agricultural students. Available incentives can provide the necessary motivation needed to encourage agricultural faculty to successfully plan and deliver agricultural distance education courses and programs.

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A Student's Perspective . . .

(continued from page 14)

of mixed graduate students and university professors. My strongest reactions to this class were in regard to this diversity of philosophies about teaching. Again, I am a graduate student with perhaps two or three years of teaching experience. My interests are still fixed on learning how to get information across and making it an enjoyable exchange. I can't see through the eyes of someone who has been teaching courses for ten to twelve years, perhaps using the same outlines and techniques, or dealing with balancing course work with research and departmental politics. Many, perhaps most, non-education majors receive their doctorates and pass into the role of college instructor never having had a course on how to be a good instructor. They are, in essence, self-taught educators who learn through the experiences they generate in their classrooms from year to year. In this course, professors and graduate students disagreed on how far they should go to reach as many of their students as possible. It was the in-class discussion of these subjects that generated the most energy and interest for me.

Conclusion

In all, this satellite broadcast course was an excellent vehicle for transmitting new ideas on instructional organization, principles, and techniques. The quality of the broadcast was exceptional, the course content was really helpful, and the discussions the material generated were eye-opening. When you have exceptional instructors, I think a course by video broadcast

At the close of each broadcast and occasionally during broadcasts, we would have group discussions . . . In my opinion, these were potentially the best learning experiences the class offered. As professional as the production was, there is no substitute for a flesh and blood instructor.

is the best way to expose as many people as possible to their skills. A really engaging speaker with a good message is something everyone interested in professional improvement needs to hear. Still, no matter how good the project is, nothing catches your attention like the exchange of ideas with someone you can touch, which is a good thing, because we would otherwise forget that interaction and touch are where all learning begins. ■

Team Teaching Via . . .

(continued from page 11)

- Consider every effort a team effort. Work as a team to develop the lesson topics, course

description, objectives, student expectations, including assignments, and criteria for grading.

- Plan lessons to blend informational techniques with group interactive techniques.
- Identify all required printed resources and have them sent to the delivery sites, with instructions as to date and time of distribution, prior to the start of the course.
- Develop detailed lesson plans with a time frame to help keep the pace of the class moving and to assist the technician in providing better technical assistance.
- Spend time the first day of class reviewing basic rules of the telecommunication system (i.e., talk into the microphone, don't whisper near the microphone, feel free to question by saying "This is Greg in Spokane, I have a question . . .") as well as getting acquainted with students at the various sites.
- Begin each class by recognizing each site ("Welcome Boise . . . are you ready to start?"). Allow time each day for giving assignments and allowing questions/comments from each site.
- Try to visit and teach from each off campus site once during the course — or better yet, team the class from each site at least one time.
- Use clear, easy to read visuals to enhance your lecture and clarify directions for group activities.
- When teaching, show your enthusiasm for the course content *and* the telecommunication system. Ultimately, you are the one who can sell the students on the course and the system. ■

The Next Best Thing . . .

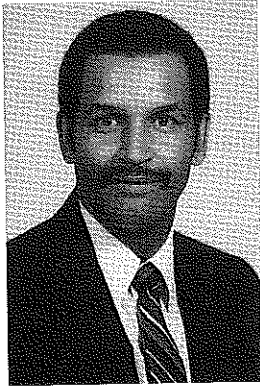
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Conclusion

What are the possibilities for distance education? As the agricultural education profession marks a new era in education by educating learners across distance, we must ask, "What can we achieve with communications technology?" What are the possibilities for postsecondary education, including graduate-level teaching, secondary teaching, or team teaching? What potential does this medium offer for regional research, for outreach and extension, for international programs, for inservice, for reaching nontraditional audiences, for meetings, and for other collaborative efforts?

It is argued that distance education cannot replace face-to-face interaction. Certainly this is a valid argument. However, in light of the need to serve distant clientele in the most effective manner, with less resources while still maintaining quality education, distance education truly can be "**the next best thing to being there.**" ■

The Need For Instruction In Agriculture To Be Delivered Via Satellite



BY BLANNIE BOWEN &
JOAN S. THOMSON

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Emerging technologies offer agricultural educators new approaches to educate heretofore unreachable audiences, as well as traditional groups, including college and secondary students, teachers, extension educators, and adults. Although these technologies have excellent potential, cost is a major limiting factor. However, a consortium of land-grant universities and governmental agencies is helping to remove cost as a major barrier to the adoption of these delivery strategies.

In 1989, the Agricultural Satellite Corporation (AG*SAT) was created so land-grant institutions, other institutions, and governmental agencies can pool their resources to better adopt these technologies for distance learning. Also, since 1991, AG*SAT has delivered several credit courses and noncredit programs. However, AG*SAT's leadership wanted to discover approaches to make the offerings available to more audiences, including agribusinesses. Thus, during 1993, AG*SAT contracted with the authors to assess the need to reach a broader spectrum of the agricultural community.

This article focuses on the study's objectives that have implications for agricultural education faculty, secondary and postsecondary teachers, and college and high school students who enroll in courses taught by these faculty. These objectives are represented by three questions:

1. What are the academic programming needs of the affiliated institutions both for future on-campus and off-campus delivery?
2. To what types of AG*SAT courses and programs will colleges of agricultural sciences subscribe if offered on a continuing basis?
3. What types of information do colleges of agricultural sciences need to be able to subscribe to AG*SAT courses and programs that are offered on a continuing basis?

The authors used the Borich (1980) Needs Assessment Model to answer the above questions. This model enabled the researchers to determine discrepancies between *what is* and *what should be*. They provided the subjects with information on what AG*SAT now delivers to assess what *should and what will occur*. The questions, procedures, and findings are presented in the following sections.

Methods and Procedures

Data were collected via a census of the (1) deans of the AG*SAT affiliates, land grant nonaffiliates, and the American Association of State Colleges of Agriculture and Renewable Resources (AASCARR) member institutions, (2) academic program deans in AG*SAT member institutions, and (3) department heads in the above institutions. An instrument the authors developed was mailed to the deans and associate deans in April of 1993. Enclosed with the academic deans' packets were department head instruments for the associate deans to distribute to all of their heads, who were to respond to their associate deans. To increase the response rate, the packets included a letter from the chair of the AG*SAT Board of Directors and an issue of the AG*SAT *Downlink* newsletter that explained the study. In June, near the end of the data collection period, the researchers called the dean or academic dean at the affiliate institutions to secure at least one response per institution. Responses were received from 89% of the 43 affiliated institutions and approximately 25% of the 82 non-affiliated institutions (NASULGC and AASCARR).

Findings

When asked how they *should* or *could* use AG*SAT, the respondents cited many areas. However, when asked how they *will* use AG*SAT programming between now and 1997, the numbers of responses became lower. This trend is apparent throughout the findings presented below.

On-Campus and Off-Campus Needs. Future on and off-campus needs focus primarily on four areas: (1) providing courses off-campus to various locations/community colleges and technical institutes, (2) downlinking courses on campus, (3) expanding and supplementing existing course offerings, and (4) as a supplement to graduate offerings (see Table 1).

Courses and Programs That Will Be Used. Three findings relate to meeting the curricula needs of Colleges of Agricultural Sciences. Courses should (1) be offered by few institutions, (2) meet needs in low enrollment programs, and (3) address special topics (see Table 2).

Flexibility Needed. The respondents identified the types of information they need to subscribe to courses and programs delivered →

via AG*SAT. The most needed types of information focus on (1) items contained in course syllabi, (2) demonstrated need for the course in terms of student demand, (3) appropriate lead time so colleges can publicize and list courses in course schedules, and (4) downlink specifics relative to how courses match the quarter and semester systems (see Table 3).

Opportunities for Agricultural Educators

Agricultural educators have offered only two courses for credit via AG*SAT: (1) *Methods of Teaching in Colleges of Agriculture* by L.H. Newcomb at Ohio State and (2) *Research Methods* by James Key at Oklahoma State. Both courses target graduate students and faculty. Yet, the technology's potential remains untapped. This study suggests a need for more process oriented courses. Because academic administrators indicate that their faculty are not familiar with the processes used to deliver distance education, this presents an excellent opportunity for departments of agricultural education. Most such departments have faculty who teach courses that can easily be adapted to include the planning, delivery, and evaluation of distance education courses and programs.

Other opportunities relate to degree programs. Randy Bretz, AG*SAT program manager, is exploring the potential of agricultural education faculty offering a master's degree via distance education. This degree could be offered by one or several universities. The proposed degree program would expand the land-grant concept to better serve the needs of a contemporary society that is increasingly relying on satellites, computers, and various communi-

cations technologies. Also, most departments of agricultural education now offer master's degree programs for teachers, extension agents, and other professionals. AG*SAT can enable agricultural educators to offer more courses that have not been offered off-campus because of distance and budgetary constraints. This study indicates that agribusiness professionals might constitute an additional audience for such courses.

From the perspective of secondary teachers, AG*SAT can become a vehicle for high school students to access agricultural science instruction that might (1) be used to meet graduation requirements, (2) serve as college prep courses, or (3) function as college placement courses. In this regard, an introductory animal science course that the University of Kentucky now offers via AG*SAT, enables high school students (1) to meet graduation requirements and (2) when they attend a Kentucky university, receive college credit for the course.

In summary, distance education's potential remains untapped by the agricultural education profession. AG*SAT is one vehicle through which the profession can better educate the population in and about the dynamic agricultural industry.

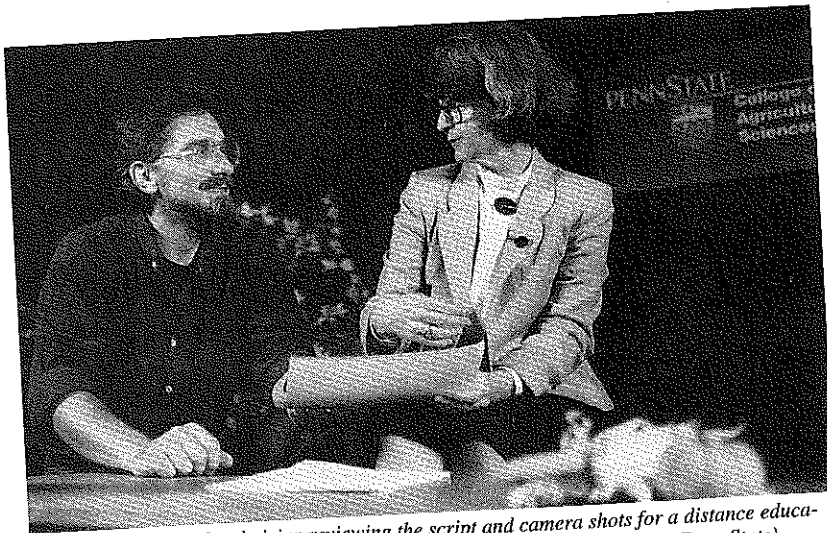
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Table 1: How Colleges of Agricultural Sciences Will Use Distance Education to Meet Academic Program Needs

Role of distance education ¹	Affiliates		
	Admin. Council (N=22)	Academic Council (N=28)	Non-Affiliates (N=20)
• Provide courses off-campus (non-campus locations/community colleges/technical colleges)	1	12	3
• Downlink courses on campus	6	6	1
• Expand/supplement current offerings	7	2	10
• Supplement graduate offerings	1	11	-
• Supplement undergraduate offerings	-	7	-
• Offer more noncredit/extension/special programming	-	6	-
• Use distance education technologies	3	1	1
• Develop faculty interest	2	1	-
• Identify funds to develop courses/programs	1	1	-
• Fill faculty vacancies	1	1	1
• Develop and use own distance education courses	1	1	-
• Downlink out-of-state	-	1	-
• Establish distance education classroom facilities	-	1	-
• Subscribe to extension programs	1	-	-
• Determine curricula needs	1	-	-
• Won't use AG*SAT/no demand	-	-	3
• Form local consortium	-	-	1
Total	25	51	20

¹ Respondents provided multiple responses.



Faculty member and technician reviewing the script and camera shots for a distance education presentation (Photo courtesy of Agricultural Communications Service, Penn State).

Table 2: Why Institutions Will Subscribe to AG*SAT Courses and Programs.

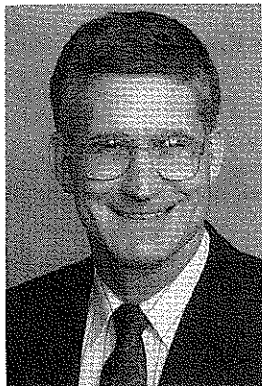
Course Characteristics	Affiliates Admin. Council (N=22)		Academic Council (N=28)		Non-Affiliates (N=18)	
	Yes	No	Yes	No	Yes	No
• Course is unique; few institutions offer it	6	10	12	11	9	3
• Course is taught by a nationally recognized master teacher	5	12	7	15	6	6
• Course meets a need in a low enrollment program	8	9	9	13	7	5
• Course (seminar) addresses a special topic	6	10	15	7	6	3
• Course(s) offers access to a degree program not available at our institution	2	13	6	15	3	8
• Multi-course series meets a program need at our institution	4	12	11	12	3	8
• Course offers advanced placement credit for high school students	2	14	6	16	-	11
• Course is part of a certificate program	1	15	6	15	-	11

Table 3: Information Colleges of Agricultural Sciences Need to Decide to Subscribe to AG*SAT Courses

Information Needed ¹	Affiliates Admin. Council (N=19)		Academic Council (N=23)		Non-Affiliates (N=18)	
	Yes	No	Yes	No	Yes	No
• Course syllabi — description, instructor credentials, credits	10	8	14	2	5	3
• Student demand/need	8	5	2	4	3	4
• Lead time — in years	5	1	4	5	-	-
• Downlink specifics (date/time/match with quarters)	1	-	4	2	-	3
• Quality assurance/value of offering/consistency	-	2	2	1	-	-
• Cost	2	2	1	1	-	-
• Equivalency re: credit offered at home institution	2	2	1	2	-	-
• Content appropriate/fit	2	1	2	2	-	-
• Current AG*SAT information adequate	1	-	2	2	-	-
• Faculty/department interest	-	-	2	2	-	3
• Institution that is offering course	-	-	2	1	-	-
• Local site requirements/infrastructures	1	-	1	1	-	-
• Assurance announced course will be taught	-	-	1	-	-	-
• Level of instruction — grad/undergraduate; upper/lower division	-	-	-	-	-	-
Total	34	34	43	43	18	18

¹ Respondents provided multiple responses.

Essential Ingredients Of A Successful Tech Prep Program



BY DON R. HERRING & CASSY B. KEY

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After having the opportunity to be involved in the implementation of Tech Prep in the state of Texas from different vantage points, the authors have attempted to merge our ideas regarding what it takes to have a successful Tech Prep program. We make no claims for expertise; we only wish to share what we have gleaned from our own experiences and those of our colleagues with whom we have worked. First, however, a brief explanation of the Texas system for Tech Prep is needed to provide the context for our discussion.

Tech Prep in Texas is being implemented through a tri-agency partnership of the Texas Education Agency, the Texas Higher Education Coordinating Board, and the Texas Department of Commerce. To facilitate implementation, 24 Quality Work Force Planning Committees, made up of employers, educators, and training providers, were established throughout the state with the charge to develop a skilled and educated work force to enhance the economic development of Texas and its ability to compete in a global economy. Specifically, they were to analyze regional job opportunities by targeting high-growth occupations, analyze related education and training needs, identify regional priorities for training programs, and develop regional service delivery plans that address these priorities (Texas Quality Work Force Planning, 1990).

Additionally, 25 Tech-Prep consortia, each staffed with a director, were established to create community-wide shared vision; coordinate the planning, development, implementation and articulation of educational programs in public high schools, community colleges, and technical institutes; and develop work-based training options for students. Students completing Tech Prep programs receive certification in a technical skill, a head start on industry training, apprenticeship credentials, and/or an Associate of Applied Science Degree (Tech Prep High School and Associate of Applied Science Degree Programs, 1992).

All Texas high school students can access Tech Prep. In September, 1993, all community/technical colleges were in a Tech Prep consortium, and approximately 85% of Texas school districts were involved (Quarterly Report, 1993). School districts in consortia are encouraged to establish articulation agreements with postsecondary institutions offering Tech Prep degree programs. Career paths begin with career assessment and counseling, at least by the 8th grade, and education plans span the 9th through 14th grades. Competencies to be taught

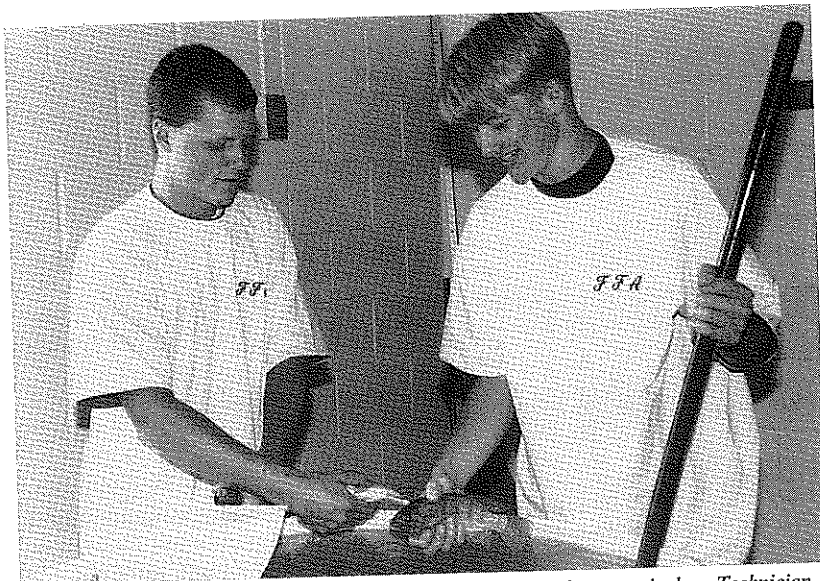
are determined via employers; course details are worked out between high school and post-secondary instructors. Under articulation agreements specific to each institution, students who successfully complete articulated courses taught at the high school can receive college credit after they pass the Texas Academic Skills Program (TASP) test and complete the first six hours of their degrees. (Requirements may vary somewhat.) A statewide professional consortium, housed at Texas A&M University, supplements professional growth activities being conducted within each of the 25 local Tech Prep consortia.

Essential Ingredients of a Successful Program

Seven essential ingredients of successful Tech Prep programs at the local level have been identified. While not all inclusive, these ingredients appear crucial to success.

Ingredient One: There Must Be Strong Philosophical Support For Tech Prep by the Institution(s) Concerned

Unless there is strong philosophical support for the Tech Prep initiative by the key stakeholders, the chance for success is slim. It is helpful if this philosophical support is articulated clearly in the mission and goal statements of the institution(s) concerned (public schools, community colleges, business/industry organizations, and other stakeholders). This means that there must be a clear understanding by all parties that Tech Prep is a viable path that prepares students for the demands of tomorrow's workplace. Tech Prep must be seen as more than just another "vocational" program. It not only holds the promise of providing our society with the skilled workers it needs and lowering unemployment, it also raises hope in desperate families and gives more students more chances to achieve the American dream. Tech Prep can open the door to some of the fastest growing and highest paying positions in our country. Tech prep also can be a trail to bachelor's and higher degrees; it simply allows students to "stop-out," earn the resources needed, and continue their paths of lifelong learning. Tech Prep infuses the competencies identified in the SCANS Report across the curricula; develops employability skills; teaches students to apply their learning; allows teachers and students to enjoy experiential learning, competency-based education, and cooperative learning; and fuses academic and vocational education. If Tech Prep is viewed primarily as a way to access federal and state funds, and the genuine commitment to the concept is lacking, it will be a "come-and-go" party. →



Aquaculture can be a real hands-on unit or course in the agriculture curriculum. Technician skills acquired in rearing fish adapt to many agriscience careers. (Courtesy of Larry Vold.)

Ingredient Two: Information About Tech Prep Must Be Communicated Effectively

The chief purpose of Tech Prep consortia is to teach people to work together in new ways. Every conceivable means must be used to communicate about Tech Prep. A media blitz is needed to help all interested parties understand Tech Prep. Newspaper articles, radio and television programs, newsletters, teleconferences, workshops, seminars, open forums, inservice programs, and other means should be used to communicate what Tech Prep is all about. The more people understand Tech Prep, the more likely it is to be supported. Stakeholder groups and vertical teams are crucial. Effective strategies for change must be utilized. Opinion leaders and decision influencers must be identified and used effectively by the change agent(s) to speed the adoption process. Those in the power structure must be identified and appropriate strategies used to secure their support. Of equal importance is the need to develop a grassroots leadership cadre of champions to ensure a critical mass.

Ingredient Three: There Must Be Strong Support From the Employer Community

Strong support from employers is crucial. In many of the Tech Prep consortia in Texas, support from employers, including labor, has been outstanding. In fact, in many communities, the driving force for the initiation of Tech Prep programs in the public schools and community colleges has been business and industry personnel. Tech Prep gets the attention of school administrators, teachers, and school board members when employers share their needs for skilled employees and their belief that Tech Prep programs can meet these needs. Employers can articulate the need for Tech Prep to educational institutions, and may also provide financial assistance for program development, opportunities for paid and unpaid student

internships and shadowing experiences, and expanded opportunities for jobs among program completers. Employers are invaluable as volunteers to speak to students regarding the employability skills they value in their workers. They also can provide valuable data about student outcomes and the labor market, especially regarding expected job openings.

Ingredient Four: Tech Prep Must Be Supported By a Comprehensive, Sequential K-14 Career Guidance Program

It makes absolutely no sense to undertake major Tech Prep initiatives without undergirding the curriculum with a strong career guidance program. The two must go hand-in-hand. A career guidance program should be comprehensive; it should include individual counseling, group guidance and group counseling, self appraisal, career information, placement, and follow-up. Orientation about the services provided in the school should be on-going. A major focus of the program at the secondary and postsecondary levels should be on the development of employable skills in students (job interviewing skills, resume development, the development of personal and professional qualities desired by employers, etc.). The information service should include a computer-assisted guidance system such as SIGI, DISCOVER, GIS, CHOICES, or some other appropriate system on the market. Ideally, a career center should be established that houses the computer-assisted guidance system and provides a place where students can go for assessment and for a chance to review occupational and educational information.

The career guidance program also should be sequential. What is done at the different levels in the educational system should build upon what has been done previously. In order for a school system to assure that its career guidance program is both comprehensive and sequential, a major review of the program will likely be needed. A systems approach should be used to evaluate the existing program and to phase-in components of the program that are deemed to have the highest priority, based on criteria established by the Tech Prep stakeholder's group. Certainly, the unmet needs of students is a critical criterion, but cost, personnel available, time required, and other factors should also be considered in the strategic plan.

Ingredient Five: Quality Staff Development Programs Must Be Implemented

This may be the most crucial of all the ingredients. Because any new thrust in education has the potential of being misunderstood, and because the enthusiastic support of all stakeholders is needed in order for Tech Prep to succeed, high quality staff development is imperative. In order for teachers, administrators, counselors, librarians, curriculum directors, and other school personnel to endorse the →

concept initially, Tech Prep must be portrayed accurately and effectively. Once the decision has been made to move forward, staff members must be trained in how to implement Tech Prep. Innovative approaches to staff development are needed. Staff should be involved in planning and designing the inservice programs they want. Some ideas for workshop topics would include: TQM; curriculum revision techniques; contextual teaching strategies; technology infusion; the fusion of arts, sciences, and technical education; competency-based instruction; effective teaching; flexible scheduling; academic teaming; thematic instruction; experiential learning; cooperative learning; leadership; and other strategies that lead to high performance. Workshops and visits to work sites conducted by business/industry personnel regarding the changing workplace have been well-received by school personnel. The highest rated staff development programs in Texas have been those conducted by business/industry personnel and field trips to business/industry sites. Opportunities for Educator-in-Industry internships also have been appreciated.

Ingredient Six: Sound Curriculum Development Techniques Must Be Employed

The systems approach should be used to define, design, develop, and assess the Tech Prep career pathways. Reasonable, yet challenging, time lines should be established. Accurate, up-to-date data showing the high-growth occupations in the region should determine the curriculum areas to target. Student and parent surveys should be conducted to determine high interest areas. SCANS competencies and TQM strategies should be incorporated to relate the content to the workplace.

Most consortia employ a task analysis approach, expert employer panels, and critical-incident techniques when designing curricula. Model Tech Prep programs in other schools and communities also can be studied. Current technology should be incorporated, and a mechanism for continuous curriculum improvement should be installed. Articulation agreements between the public school and community college must be carefully formulated. All stakeholders must come to the table. A high level of trust and collaboration must be established so that turf issues can be resolved.

Teams consisting of secondary and postsecondary academic and technical faculty, counselors, administrators, business/industry personnel, and other stakeholders should be formed to establish an infrastructure before curriculum development begins. A Tech Prep curriculum library should be established in the consortium for teachers, counselors, and administrators to access.

Ingredient Seven: There Must Be Continuous Evaluation of the Tech Prep Program and Modifications Made As Needed

If the systems approach is utilized as suggested earlier, continuous evaluation and program modification will be an on-going process. Both the process (methods and techniques) and the product (mastery of objectives by the students) should be evaluated. A systematic follow-up of stop-outs and graduates can help determine needed program modifications. Data also should be gathered from in-school students, teachers, administrators, counselors, and employers who hire students. Data should not be used punitively, but rather as a mechanism to inspire continuous improvement.

Summary

Successful Tech Prep is dependent upon sound principles of operation. In summary, seven success factors are as follows:

- Strong philosophical support for Tech Prep by the institutions concerned;
- Sound communication channels;
- Strong support from the employer community;
- A comprehensive, sequential K-14 career guidance program;
- Quality staff development programs;
- State-of-the-art curriculum development techniques; and
- Continuous evaluation and improvement of the Tech Prep system.

What Tech Prep requires most is transformational leadership that crosses all ranks and all walks of life. It's a first-chance program designed to help students by empowering them with the skills to earn a living after high school while they pursue postsecondary, industry, or apprenticeship training. We see Tech Prep as our nation's most viable path to the preferred future because it "democratizes" education and can open the door to the American dream for hundreds of thousands of those who may otherwise find it closed.

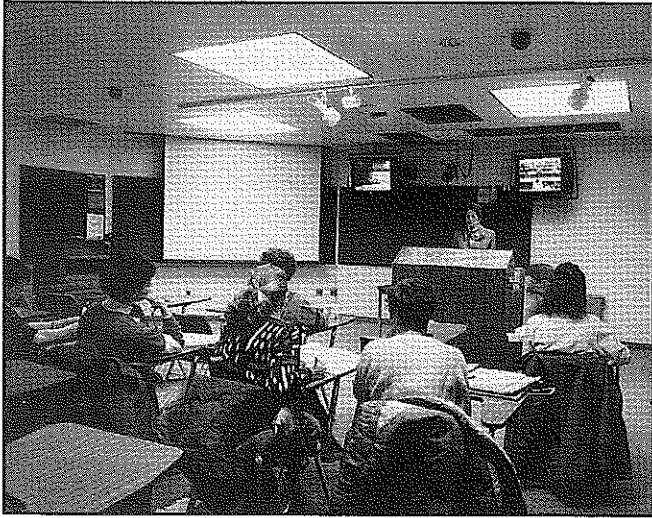
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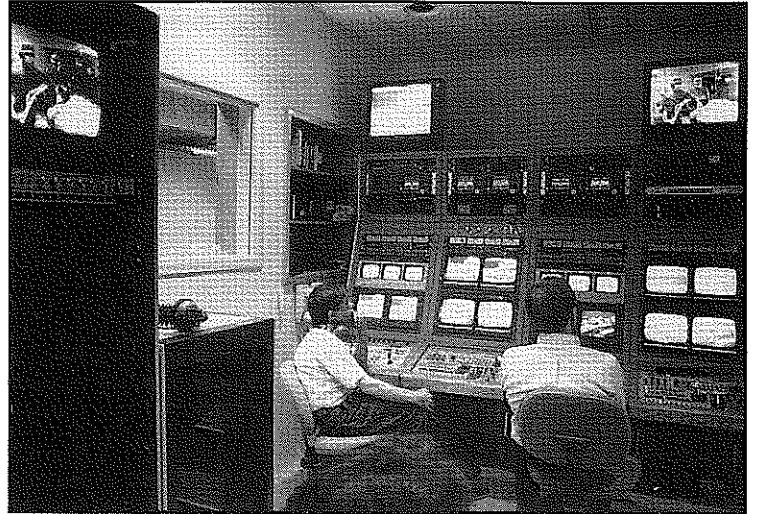
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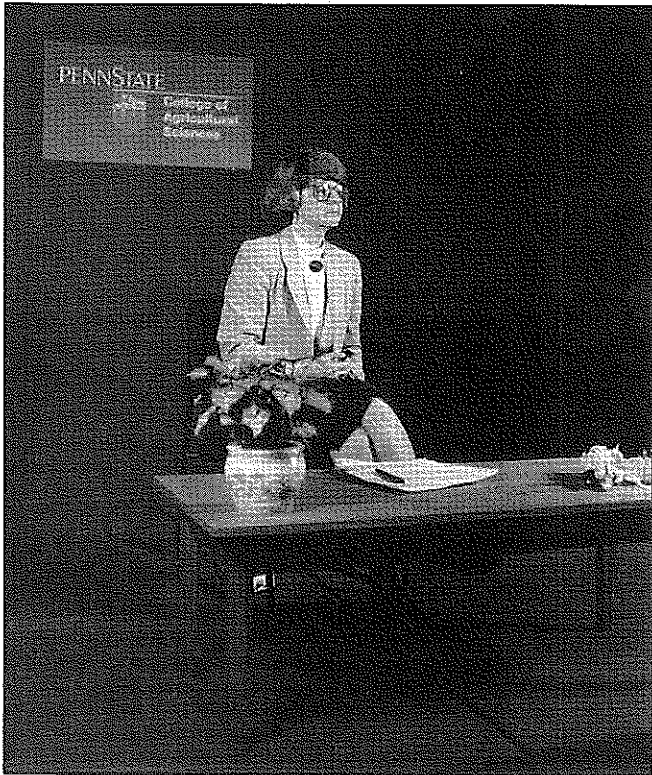
Stories in Pictures



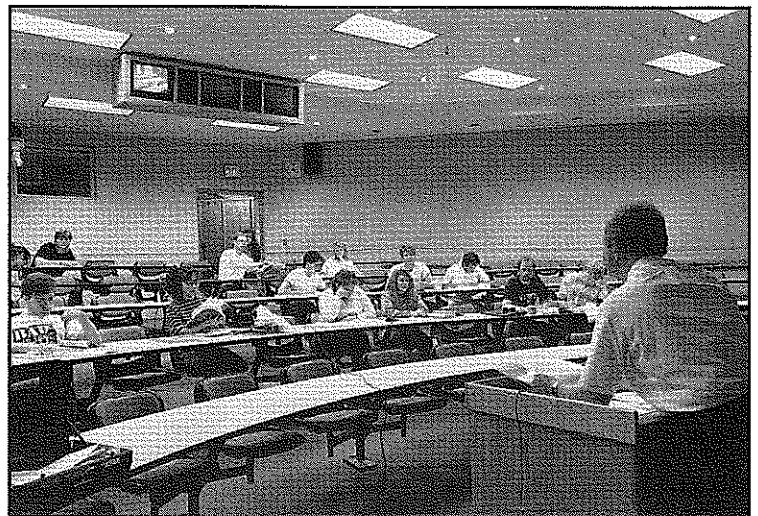
Jan Halloway teaches WHETS class at Washington State University. (Photo by Betty Lea Trout.)



Telecommunications control room. (Courtesy of Pam Benham.)



Faculty member delivering an educational program via distance education. (Photo courtesy of Agricultural Communications Service, Penn State University.)



Modern classrooms equipped with the latest technology are essential for effective delivery. (Courtesy of Linda Anthis.)