Department Head Perceptions of the Need for Distance Education in the Agricultural Sciences

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This assessment was requested by AG*SAT, a consortium of land-grant universities created to plan, coordinate, and deliver distance education in the agricultural sciences. The perspectives of department heads regarding the delivery of credit instruction using AG*SAT and related technologies were assessed. The heads indicated that their departments will subscribe to one-of-a-kind courses and courses taught by nationally recognized faculty. Most of those surveyed support faculty involvement in distance education, but they perceive that faculty need in-service education in order to teach distance courses effectively. Several programming issues were identified that have implications for ag communicators.

Introduction

Video technologies during the 1970s enabled agricultural communicators who had either professional broadcast training or a casual interest in the technologies to deliver better in-service training for Extension staff. These technologies also allowed agricultural communicators to help specialists and faculty deliver high quality programming, which previously had been limited to the broadcast industry. As the decade of the 1970s closed, broadcast units that emerged in colleges of agricultural sciences began producing programs such as *Farmweek*, a weekly program produced by the Mississippi Cooperative Extension Service for educational television stations in that state.

As video technologies became commonplace in American homes during the 1980s, Extension professionals further expanded their use of video by targeting clientele who wanted more educational and "how to" programming (Yates & Smith, 1988; Scherer & Masiclat, 1988). In a related vein, Scherer (1988) found that interest in Extension topics was positively related to whether or not clientele rented videocassette tapes.

The 1980s also brought technologies that required agricultural communicators to fulfill multiple functions. During this decade, agricultural communicators served the traditional role of delivering computer training for Extension field staff, specialists, and resident education faculty. The emergence of computer technologies was of such magnitude that new units surfaced in many universities to handle responsibilities related to the development and maintenance of comprehensive computer systems, such as the Pennsylvania Educational Network (PEN) that has both database and electronic mail capacities (Shaffer & Bowen, 1992).

In many colleges of agricultural sciences similar to the one at Penn State, computer groups emerged as free-standing units. In other colleges, such as those at Ohio State and North Carolina A&T, computer-oriented communicators were integrated into existing communications units. Regardless of administrative structure, computer technologies became so pervasive that an annual Extension technology conference was initiated. Within ACE, these technologies also led to the creation of a computer technology special interest group.

As the 1980s closed, major efforts began to merge video and computer technologies to better serve the needs of Extension audiences. This merger brought interactive video technologies to the forefront as a delivery system for Extension programming (Gleason, Fedale, King, & Miller, 1987; Rockwell & King, 1988; Rockwell, Tate, & King, 1989).

During the 1990s, a major goal of most colleges of agricultural sciences is the integration of video and computer technologies into communication systems that facilitate the delivery of education at a distance. Nationally, the integration of these technologies is also a goal of the Cooperative Extension System. In 1990, the Extension Service of the USDA (ES-USDA) and the Extension Committee on Organization and Policy (ECOP) created a Future Application of Communication Technology committee to study current and future Extension activities involving communication technology (ECOP & ES-USDA, 1991). This committee produced a strategic implementation plan relative to communication technology, including distance education (ECOP & ES-USDA, 1992).

From a program delivery perspective, the merger of these technologies is of such great magnitude that Extension programming and resident education instruction can now be delivered easily by satellite. Consequently, downlink sites have been or are being created in many county Extension offices. Furthermore, many schools, especially those in rural areas, now have or are acquiring extensive downlink capabilities (Swan, 1993). This situation means that both noncredit and credit programming can be downlinked to audiences at sites previously not accessible to colleges of agricultural sciences.

Objectives of the Study

In 1989 several land-grant universities created a consortium (the Agricultural Satellite Corporation or AG*SAT) to enable colleges of agricultural sciences and their communications units to function more effectively. A central goal of this consortium is to plan, coordinate, and deliver distance education in the agricultural sciences. The assessment reported here was requested by AG*SAT to determine the perspectives of department heads regarding the potential of delivering credit instruction using the AG*SAT network and related technologies. Objectives drawn from the assessment that have implications for agricultural communicators are listed below:

1. To describe the distance education academic programming needs of departments that deliver baccalaureate or higher levels of instruction in the agricultural sciences.
2. To assess the technical infrastructure and support systems that are available for academic departments to engage in distance education credit courses and programs.
3. To describe the programming considerations of department heads relative to the delivery of distance education.

Methods and Procedures

The Borich Needs Assessment Model (1980) provided a systematic means to analyze data related to the three objectives. This model allows researchers to determine discrepancies between "what is" and "what should be." Thus, the department heads were provided information on state-of-the-art programming delivered via AG*SAT and related technologies. These individuals then evaluated the information to determine: (1) What should occur and (2) What will occur. Discrepancies between what is occurring as opposed to (1) What is possible and (2) What is realistic were used to provide recommendations to plan future programming delivered by AG*SAT.

Data were collected through a census of department heads in U.S. colleges of agricultural sciences that offer B.S. or higher levels of instruction. The census included both the 1862 and 1890 land-grant

institutions and the member institutions of the AASCARR (American Association of State Colleges of Agriculture and Renewable Resources). Mailing lists supplied by AG*SAT's program manager were used to administer a survey instrument. The executive committee of AG*SAT's Academic Programs Council and AG*SAT's program manager reviewed the instrument for content and face validity. Descriptive statistics were used to summarize the data.

The instrument and cover letters were mailed to the academic program deans the first week of April 1993. Enclosed with the academic dean packets were copies of a survey for the academic deans to distribute to all department heads in their colleges. Department heads were asked to respond to their academic dean who mailed the packet to the researchers. In most instances, the prescribed pattern was followed; however, a few department heads mailed the instrument to the researchers.

To increase the response rate, packets included a cover letter from the chair of the AG*SAT Board of Directors and a recent issue of AG*SAT's newsletter *Downlink* that included details on the study. Near the end of the data collection period (June 1993), the research-

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TABLE 1:
*Responses to the Survey of Colleges of Agricultural Sciences Department Heads by Type of Institution and Type of AG*SAT Affiliation* *

Type of Institution	# of Department Heads Responding
1862 Land Grant	191
1890 Land Grant	19
AASCARR Universities	17
TOTAL	**227**

Type of AG*SAT Affiliation	Institutional Response
AG*SAT Affiliates (Land Grants)	26 out of 43 (190 Department Heads)

Not Affiliated With AG*SAT

NASULGC Institutions	5 out of 27	(19 Department Heads)
AASCARR	11 out of 55	(18 Department Heads)

TOTAL   42 of 125 Institutions (227 Dept. Heads)

*In April 1993, 43 land-grant institutions and 2 governmental agencies were AG*SAT affiliates.

ers called the dean or academic dean at the AG*SAT-affiliated institutions that had not responded to encourage them to participate. Given the singular nature of the study, no additional follow-ups were deemed appropriate. Using these approaches, 227 department heads in 42 of 125 NASULGC and AASCARR institutions provided usable data. An analysis indicated that 190 of the heads were located in 26 of the 43 land-grant institutions that were AG*SAT members in April 1993. Distributions of the 227 respondents after three months (April-June, 1993) are presented in Table 1.

Findings

Table 2 shows that most of the heads (chairs) were leaders of departments traditionally found in colleges of agricultural sciences: animal sciences, which includes poultry and dairy (23 heads); agronomy (22); horticulture and agricultural economics (18 heads each); agricultural education (16); food science (15); plant pathology (14); entomology (10); and forestry (8). However, the largest single group of department heads (78) were leaders of comprehensive academic units that could not be classified into traditional disciplines found in most colleges of agricultural sciences.

Major findings for the three objectives are summarized below. The Borich (1980) approach elicited responses that became less positive as more certainty was requested. For example, when the depart-

TABLE 2:
*Academic Departments of Heads Responding to the AG*SAT Survey*

Department	# of Responses
Animal Sciences (Including Poultry and Dairy)	23
Agronomy/Soils	22
Agricultural Economics	18
Horticulture	18
Agricultural Education	16
Food Science	15
Plant Pathology	14
Entomology	10
Forestry	8
Biochemistry	5
Other (Agriculture, Various Titles)	78
TOTAL	**227**

TABLE 3:

How Departments in Colleges of Agricultural Sciences Will Use Distance Education to Meet Academic Program Needs

Will Subscribe to:	# of Heads Responding YES*
One-of-a Kind Courses	145
Courses Taught by Nationally Recognized Faculty	129
Courses That Fit into a Major or Degree Program	96
Low Enrollment Courses	92
Unique Courses	72
Seminar or Special Topic Courses	64
Multi-Course Series or Programs	24
Courses That Fit into Certificate Programs	19

* Department heads were asked to respond to each item.

ment heads were asked how they *should* or *could* use AG*SAT programming, they cited numerous areas. However, when asked how they *will* use AG*SAT programming between 1993 and 1997, the number of responses becomes lower. This trend prevailed throughout the findings for all three objectives.

Objective #1 (Programming Needs)

Department heads responding to the assessment indicated that their departments will subscribe to one-of-a kind courses (145 heads) and courses taught by nationally recognized faculty (129 heads). As shown in Table 3, the heads also indicated that they will subscribe to: (a) Courses that fit into a major or degree program (96 heads) and (b) Low enrollment courses (92 heads). As evident by the low number of departments that will subscribe, the heads were least interested in multi-course series or programs (24 heads) and courses that fit into certificate programs (19 heads).

Objective #2 (Infrastructure and Support Systems)

The majority of the department heads (177 heads) indicated that they support their faculty delivering and receiving instruction through distance education (Table 4). The heads also indicated that their college's administrators provide similar levels of support (145 heads). Concerning the desire to downlink, 104 of the heads reported that their college strongly supports AG*SAT programming being included as a vital part of college's instructional programs. In terms of rewards and incentives to become involved in distance

TABLE 4:
Technical Infrastructure and Support Systems Available for Departments to Engage in Distance Education Programming

Infrastructure/Support System	# of Heads Responding YES*
Do you support your department's faculty downlinking courses?	177
Do your college's administrators support receiving courses from other institutions?	155
Should faculty receive promotion and tenure credit for teaching distance education courses?	145
Does your college strongly support AG*SAT programming as a vital part of college's instructional programs?	104
Has your college allocated funds to downlink courses?	72
Has your department allocated funds to downlink courses?	15

*Department heads were asked to respond to each item.

education, 145 heads indicated that their faculty should receive promotion and tenure credit for their involvement in distance education. However, from a resource perspective, only 72 of the heads indicated that their colleges allocate funds to downlink courses. Even fewer heads (15) indicated that their departments allocate funds for faculty to downlink courses.

Objective #3 (Programming Considerations)

When asked about the types of distance education programming considerations that their faculty face, most department heads (157) cited faculty training (Table 5). Another major consideration related to the times of day when distance education courses should be offered. A majority of the heads (142) wanted the AG*SAT courses offered at various times of the day and in one-hour blocks (99 heads). Two-hour blocks constituted the second time choice of the heads (40). Concerning the interaction between distance education instructors, downlink site coordinators, and students enrolled in courses, most heads (131) preferred two-way audio and video. Fax machines and computers were the second and third most preferred means to enhance interaction in distance-education courses. Concerning sequencing, a number of the heads (77) wanted courses in modules.

In terms of who should offer courses and degree programs, only 52 of 227 heads wanted the AG*SAT-affiliate institutions to offer degree programs or parts of programs using distance education.

Discussion

This study documents that there is a demand for distance education programming to meet the needs of contemporary society. In particular, the findings point to a desire for instruction that meets resident education needs. The findings also imply that colleges of agricultural sciences in general and agricultural communicators in particular should examine the educational opportunities that technologies are creating. A rich tradition of delivering outreach through the Cooperative Extension System and a vast cadre of human and technical resources collectively make colleges of agricultural sciences an ideal unit to deliver education from a distance.

TABLE 5:
Programming Considerations of Department Heads Relative to the Delivery of Distance Education

Type of Consideration	# of Heads Responding YES*
Should courses be offered at various times of the day?	142
In what time blocks should courses be offered?	
One Hour 99	
Two Hour 40	
Three Hour 9	
Should courses be offered in modules?	77
Should AG*SAT affiliate institutions offer degree programs or parts of programs using distance education?	52
Do your faculty need additional education to teach distance education courses effectively?	157
What types of interaction are needed between instructors, downlink site coordinators, and students enrolled in distance education courses?	
2-way video and audio 131	
FAX machine 77	
Computer 72	
Telephone 20	

*Department heads were asked to respond to each item.

To meet such a demand, however, will require philosophical and institutional shifts regarding how distance-education instruction is delivered. For example, as currently structured, the land-grant institution in each state that has the predominant research mission serves as the broker for credit courses delivered through the AG*SAT system. This model requires extensive cooperation among academic institutions in states that have multiple universities offering credit instruction in the agricultural sciences. Furthermore, when the vast international markets are considered, other administrative, philosophical, and academic issues emerge. Consequently, the prevailing model of offering credit courses primarily on university campuses must be revisited before the potential of distance education can be realized. These issues exist even though, from a technological perspective, a student needs only a downlink site and the appropriate technology to receive the desired instruction.

For agricultural communicators, the findings magnify issues that were identified by Scherer and Masiclat (1988), who found that the top two new technology training needs of Cornell Cooperative Extension agents focused on computers and video. Additionally, they found that these agents had strong desires for training in conceptual areas related to communications strategies and media selection. Similar issues must be addressed before colleges of agricultural sciences faculty can effectively deliver distance education via satellite. To date, few faculty have been prepared to deliver high-quality instruction via media such as television. Consequently, agricultural communicators who have expertise in the broadcast media are in ideal positions to deliver the needed in-service training for faculty. Inherent in such training must be quality-control issues relative to course preparation and delivery and the evaluation of instruction (Bowen & Thomson, 1994).

From a developmental perspective, the findings suggest that the technologies used to deliver distance education already exceed the current mode of offering credit instruction in the agricultural sciences. Consequently, there is a strong need for process- and people-oriented instruction that agricultural and Extension education and rural sociology faculty routinely teach on university campuses. However, to date, few faculty have taught such courses with a distance-education focus. This situation further illustrates that colleges of agricultural sciences have yet to tap the technology's potential. This void creates opportunities for agricultural communicators to use conceptual models such as the one developed by Jackson and Bowen (1993) to prepare faculty to be effective distance educators.

In a related vein, opportunities exist for agricultural communications faculty relative to external degree programs. AG*SAT's pro-

gram manager and a group of agricultural and Extension education faculty are exploring the potential of offering a master's degree via distance education (Personal interview with Randy Bretz, July 27, 1994). However, this degree program will be targeted primarily to Extension professionals. Under the current plan, this degree can be offered by one or several universities. The proposed degree will expand the land-grant concept to serve better the needs of contemporary society, a society that is increasingly relying on satellites, computers, and various telecommunications technologies. As now conceived, the proposed external master's degree will enable colleges of agricultural sciences faculty to serve better traditional audiences, i.e., Extension agents and secondary teachers. Noticeably absent from this list of target audiences are the agribusiness, communications, and private industry sectors. Consequently, to capitalize on the range of opportunities, agricultural communicators and ACE must become more involved in offering courses and programs for multiple audiences that have not been served for various reasons, including distance and budgetary constraints.

Recommendations

The findings prompted the following recommendations.

1. Agricultural communicators should develop consortia through which distance education, which includes AG*SAT and other telecommunications delivery systems, can be used nationally and internationally to deliver credit courses for more high school, post-secondary, adult, and college students seeking bachelor's or graduate degrees.

2. Colleges of agricultural sciences faculty wishing to participate in such consortia should examine their philosophies of the land-grant system with the goal of modifying their paradigms to include programming for audiences beyond the traditional 18-22 year old category.

3. AG*SAT should involve agricultural communicators in developing marketing strategies to reach more effectively nontraditional audiences that include agribusiness firms, professional agricultural associations, and students who do not want to come to university campuses to participate in resident education instruction.

4. Within ACE, the distance education special interest group should become more active in delivering in-service education for ACE professionals who wish to be more involved in delivering educational programming from a distance.

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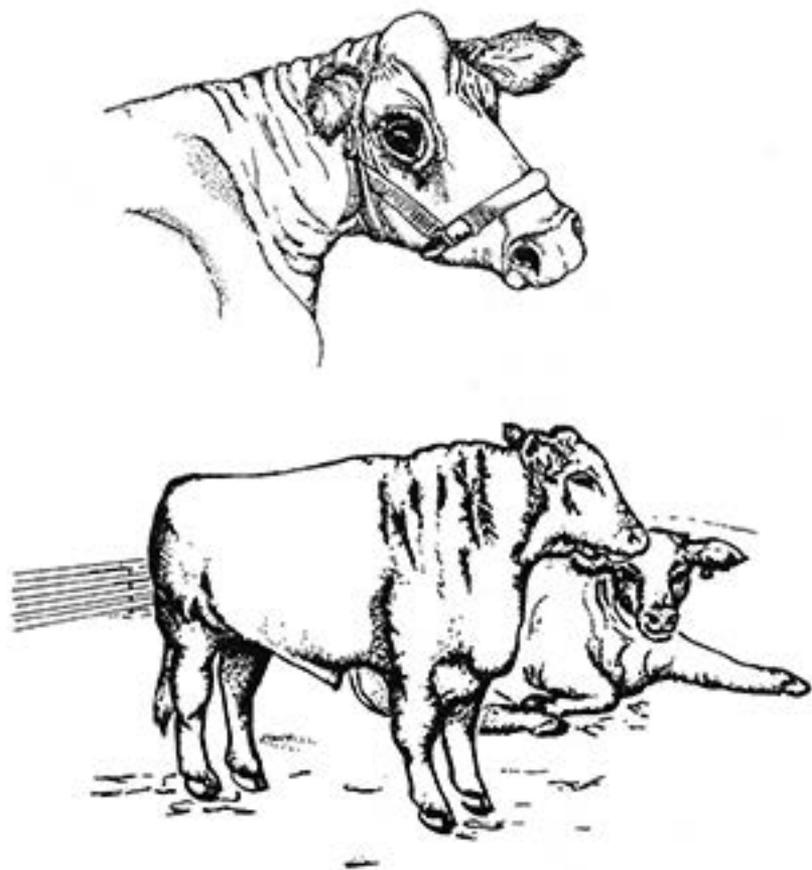
Illustrations by Melanie Eirich

The illustrations on the following pages feature a project that portrayed a videotape series and videoconference on Total Quality Management for 4-H Youth Producers. The six areas featured included: Aquaculture, Dairy, Beef, Swine, Sheep and Poultry. The project was a joint effort between Nebraska and Iowa State land-grant universities. (See page 25.)