

## AG\*SAT: AN INTERNATIONAL DISTANCE EDUCATION ALTERNATIVE

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### Abstract

*Numerous changes occurring within the profession of agricultural education are prompting agricultural educators to explore the advantages of delivering credit instruction via distance education technologies. In this regard, the Agricultural Satellite Corporation (AG\*SAT), a consortium of primarily land grant universities, commissioned a study to assess the opportunities for institutions to deliver more agricultural and natural resources instruction via the AG\*SAT network. The findings of this assessment indicate that these institutions want to deliver more instruction via satellite. This instruction focuses primarily upon emerging topics and areas in which the universities have limited capacity to fulfill. The findings provide numerous implications and opportunities for agricultural educators.*

America's colleges of agricultural sciences that have a land grant mission are expected to deliver outreach to clientele. To date, such outreach has occurred primarily through the Cooperative Extension System that has an office in most counties. This outreach has traditionally included (1) nonformal education not leading to an academic degree and (2) research generated by experiment station scientists. Rarely has this outreach included credit courses taught by agricultural sciences faculty away from the main campus.

However, because of advances occurring in communication technologies, these colleges are increasingly exploring strategies to reach larger numbers of students and clientele. Consequently, most land grant as well as nonland grant institutions offering degrees in agriculture are exploring approaches to deliver credit instruction at sites far removed from their main campuses.

In addition to technology, this shift in philosophy is being influenced by three noteworthy trends. First, a significant number of nontraditional adult students (individuals beyond the typical 18-22 year old range) want to complete degrees in the agricultural sciences (Miller & Honeyman, 1993). Second, individuals who fall into this category are

often employed and cannot readily leave their positions to complete an undergraduate degree or in instances where they already have a baccalaureate, a graduate degree.

An example of this type of delivery can be found at Iowa State University where 78 students were enrolled Fall 1992, in courses offered by videotape through the College of Agriculture (Miller & Honeyman, 1993). Third, distance education technologies are expanding the range of possibilities that colleges of agricultural sciences have to deliver credit instruction to clientele, especially those located in rural areas of the U.S. and internationally (Swan, 1993). Collectively, these trends illustrate the range of opportunities that America's universities have to develop and deliver credit instruction to heretofore underserved audiences.

The philosophy guiding most distance education in agriculture currently being planned and delivered is consistent with a 1987 definition provided by Garrison and Shale: "Any formal approach to learning in which the majority of the instruction occurs while the educator and learned are at a distance from each other" (Grimes, 1993). This definition has recently been expanded to include five levels as a result of a position paper

developed by the distance education committee of Pennsylvania's directors of Instructional Materials Services (IMS): (1) taped programming with one-way communication, (2) one-way communication in real time involved in the programming, (3) programming with real time two-way communication involving audio and/or data delivered via computer, (4) programming via two-way audio and video communication programming over telephone lines, and (5) programming delivered in real time with two-way audio and video via data lines (Pennsylvania IMS Directors, 1994).

Opportunities that distance education presents higher education can be illustrated by two examples at The Pennsylvania State University (Ryan, 1994). In cooperation with its College of Engineering and the Division of Continuing and Distance Education, Penn State broadcasts a master's degree in acoustical engineering to students located in Panama City, FL; Seattle; San Diego; and Philadelphia.

A second example involves Penn State's College of Liberal Arts, which in conjunction with the Division of Continuing and Distance Education, broadcasts administration of justice courses via the Law Enforcement Television Network for more than 650,000 law enforcement and corrections officials located in more than 4,000 sites.

From a financial perspective, distance education is being viewed in some quarters as a means to stretch scarce faculty resources. For example, limited resources mean that instructors are being shared by several community colleges in Virginia (Sachs, Wilkinson, & Murphy, 1993). This arrangement enables receiving institutions to downlink courses without having to compensate an instructor for the course. The receiving institution pays a delivery fee and working agreements specify the nature of both the delivery and receiving responsibilities of institutions involved in the partnership.

From an adoption perspective, through a

study of more than 1,300 schools, Steele (1993), identified several distance education success stories. Three of the most prominent examples include (1) the Education Network in Augusta, Maine, that delivers distance education to high schools using fiber optics, (2) the Louisiana School for Math, Science, and Arts that exposes academically talented students to prominent artists using distance education, and (3) an international partnership wherein an interactive video satellite link between the University of Lowell and Karlsruhe, Germany, enables 8th graders in Massachusetts and Germany to interact on a regular basis.

In response to the opportunities that distance education presents colleges of agricultural sciences, in 1989, a consortium of land grant universities was created (The Agricultural Satellite Corporation or AG\*SAT) to plan, coordinate, and deliver distance education in the agricultural sciences and natural resources. To enable AG\*SAT to better achieve its objectives, this assessment was conducted to determine the need for the potential of delivering credit instruction using the AG\*SAT network and related technologies.

## Objectives

The objectives of the assessment were to:

1. Provide detailed information about the academic programming needs of the affiliated institutions both for future on-campus and off-campus delivery.
2. Determine which programs (including individual courses, programs, and multi-course series) institutions will use if they are available on a sustaining basis.
3. Discover and recommend the means to provide more flexibility in delivery systems for the agricultural education system.
4. Differentiate between those special and

unique offerings which may be needed once and which are ongoing to augment existing curricula or programs.

5. Evaluate low enrollment areas which might be better served by pooling resources.
6. List future areas where programming needs will exist and have not been developed.
7. Identify programs common at all or most institutions which can be delivered by AG\*SAT.
8. Recommend a pricing structure within the budget of the affiliate institutions to provide adequate funds for the administration, production, and delivery of courses and programs.

### **Methods and Procedures**

The Borich (1980) needs assessment model provided a systematic means to collect, analyze, and interpret data relative to the objectives. This model enabled the researchers to assess discrepancies between what is and what should be. Thus, subjects included in this study were asked to use the state of the art to assess (1) what should occur and (2) what will occur relative to distance education in agriculture and natural resources. Discrepancies between what is occurring versus what is possible and realistic provided a systematic means to plan programming to be delivered via AG\*SAT. The executive committee of AG\*SAT's Academic Programs Council and AG\*SAT's program manager reviewed the instrument for content and face validity. Given the types of data that were collected, internal consistency reliability coefficients were not warranted. Descriptive statistics were used to summarize the data collected through this census study.

Data were collected via a census of (1) the deans of the AG\*SAT affiliates, land grant nonaffiliates, and member institutions of the

American Association of State Colleges of Agriculture and Renewable Resources (AASCARR); (2) the academic program deans in the AG\*SAT member institutions; and (3) department heads in all of the above institutions. Mailing lists supplied by the AG\*SAT program manager were used to administer the surveys. The instrument and a cover letter were mailed to the deans and associate deans the first week of April 1993. Enclosed with the academic dean packets were copies of a department head instrument for the associate dean to distribute to all department heads in their colleges. The department heads were asked to respond to their associate 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, the packets included a cover letter from the chair of the AG\*SAT Board of Directors and a recent issue of the AG\*SAT newsletter, *Downlink*, that included details on the study. Also, AG\*SAT's program manager sent an electronic mail message to the deans encouraging them to participate and to have their associate deans and department heads respond. 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 from each institution. Given the nature of the study, no additional follow-ups were deemed appropriate. Presented in Table 1 are the responses from each group after three months (April-June).

### **Findings**

Major findings for the objectives are summarized below. The *should*, *could*, and *will* approach (Borich, 1980) elicited responses that became less positive as more certainty was requested. For example, when respondents were asked how they *should* or *could* use AG\*SAT, 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 is apparent throughout the findings for all eight objectives.

**Objective #1.** Future on and off-campus needs focus primarily on (1) providing courses off-campus to various sites including 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. Findings as provided by administrators in the AG\*SAT

affiliates and nonaffiliate institutions are summarized in Table 2.

**Objective #2.** Three major findings emerged relative to meeting the curricula needs of institutions that want to offer courses via AG\*SAT. Courses or seminars should (1) be unique in that few colleges offer them, (2) meet a need in low enrollment programs, and (3) address an emerging or special topic (see Table 3).

Table 1. Responses to the AG\*SAT Survey of Affiliated and Non-affiliated Colleges of Agricultural Sciences

<u>Affiliated institutions</u>	<u>Institutional response</u>	<u>Percent</u>
•Administrative Council Rep <sup>1</sup>	22 of 43 institutions/agencies	51%
•Academic Council Rep	29 of 41 institutions <sup>2</sup>	71%
•Department Heads	26 of 43 institutions (183 Heads)	--
<u>Non-affiliated institutions</u>	<u>Institutional response</u>	<u>Percent</u>
•NASULGC		
-Deans and Directors of Agriculture	8 of 27 institutions	30%
-Department Heads	5 of 27 institutions (19 Heads)	--
•AASCARR		
-Deans/Directors of Agriculture	12 of 55 institutions	22%
-Department Heads	8 of 55 institutions (18 Heads)	--

<sup>1</sup>In April 1992, 43 land-grant institutions and two governmental agencies were AG\*SAT affiliates; the same institutional representative may serve on more than one AG\*SAT Council.

<sup>2</sup>At 11 institutions, both the Administrative Council and Academic Council representatives replied; in total, responses were received from 40 of 45 (89%) affiliates.

Table 2. How Colleges of Agricultural Sciences WILL Use Distance Education to Meet Academic Program Needs

<u>Affiliates</u>
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Role of distance education <sup>1</sup>	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 and 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	1
• Subscribe to extension programs		1	--
• Determine curricula needs		1	--
• Will not use AG*SAT/no demand	--	--	3
• Form local consortium	--	--	1
Total	25	51	20

<sup>1</sup>Respondents provided multiple responses.

Table 3. Why Institutions *WILL* Subscribe to AG\*SAT Courses and Programs

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Affiliates

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Course Characteristic	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 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 <b>not</b> 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
• Course is part of an associate degree program	1	15	1	20	--	11

**Objective #3.** Two significant findings relate to (1) cost and funding of AG\*SAT courses and (2) the limited capacity of institutions to downlink programming. The time of day that courses will be offered and blocks used for the courses also relate to the desired flexibility.

**Objective #4.** Responses sought to the proposed courses for fall 1993 and spring 1994 were used to obtain indications of the types of desired programming. Most courses that the institutions **will** subscribe to relate to unique courses or courses that apply to a region of the U.S. Unique courses such as engineering plant and animal environments, landscaping for the interior West, teaching methods, ethics, and agri-biotechnology were most popular.

**Objective #5.** The respondents were asked to identify low enrollment courses that they will subscribe to if offered on a sustained basis. Few such courses emerged. In fact, even in areas such as poultry that have limited enrollments, the respondents **will not** subscribe to such courses. An answer for the reluctance to commit to such courses was gleaned from responses that colleges have faculty to teach such courses and there is limited student demand.

**Objective #6.** Deans and department heads indicated that they will subscribe to new courses in several areas if there is an identified need and high student demand. Also, such courses should be one-of-a-kind and taught by nationally recognized faculty. These findings, however, should be

interpreted with caution. Although department heads were familiar with AG\*SAT, they perceive that their faculty were unfamiliar with the system. In addition, the department heads were reluctant to (1) replace existing courses if offered on a sustained basis and (2) subscribe to more AG\*SAT courses if their enrollments **decrease**.

**Objective #7.** The most common distance education programming needs relate to (1) unique courses offered by few institutions, (2) seminar or special topic type courses offered once, and (3) multi-course series and programs (see Table 3).

**Objective #8.** The respondents **can** and **will** pay a maximum of either \$500 or \$1,000 to subscribe to AG\*SAT courses and seminars. Faculty development programs and workshops were the two topics that the institutions **will** pay an access fee in addition to the subscription fee. As part of their annual membership fee, the respondents want expanded course offerings, unique courses, courses that fill gaps in their curricula, and courses that can serve as outreach for community colleges.

### **Discussion**

The findings of this study suggest that colleges of agricultural sciences will increasingly use distance education to reach more clientele and students, especially nontraditional students who do not fit the typical 18-22 year old profile. Embedded in the findings, however, are issues relative to academic turf and how to manage instruction effectively beyond the confines of a university's main campus and state. Currently, the land grant institution with the predominant research mission in a state serves as the broker for all AG\*SAT delivered instruction downlinked in that state.

Consequently, such an approach requires extensive cooperation, especially in states where two or more institutions offer degrees in agriculture, natural resources, and related areas. Further, when the vast international markets are

considered, other administrative, philosophical, and academic issues emerge. The findings suggest that the prevailing land grant paradigm perhaps needs to be revisited before the potential of distance education can be realized by institutions that wish to offer such instruction.

In spite of the above issues, distance education technologies are such that a student needs only a satellite dish and the proper coordinates for the delivering satellite to receive instruction delivered via AG\*SAT. Consequently, this study suggests that the technologies used to deliver distance education in agriculture exceed the current land grant philosophy. The findings also provide colleges of agricultural sciences with implications for practice that must be addressed before the ideal of distance education can be realized.

From an agricultural and extension education perspective, several implications for practice are also apparent (Bowen & Thomson, 1994). From an adoption standpoint, to date, agricultural and extension educators have offered only two credit courses via AG\*SAT: (1) methods of teaching in colleges of agricultural sciences by L. H. Newcomb at The Ohio State University and (2) research methods and design by James Key at Oklahoma State University. Both courses target limited audiences, i.e., graduate students and faculty. Consequently, such offerings indicate the profession has yet to tap the technology's potential.

Further, the findings suggest a need for more process oriented courses. Because department heads indicate that their faculty are not familiar with the processes used to deliver distance education, this situation presents viable opportunities for departments of agricultural and extension education. Most departments have faculty who teach courses that can easily be modified to include the planning, delivery, and evaluation of distance education courses and programs. In this regard, Jackson and Bowen (1993) have developed a conceptual model that enables faculty to deliver instruction effectively via

distance education.

In a related vein, opportunities exist for agricultural and extension educators relative to external degree programs. AG\*SAT's program manager and a group of agricultural and extension education faculty are exploring the potential of offering a master of extension education degree via distance education (personal interview with Randy Bretz, December 5, 1993). Under the current plan, this degree can be offered by one or several universities.

The proposed degree will expand the land grant concept to better serve the needs of contemporary society that is increasingly relying on satellites, computers, and various telecommunications technologies. Further, most departments of agricultural and extension education offer master's degree programs for teachers, extension agents, and other professionals. However, to capitalize on the opportunities, AG\*SAT must be viewed as a vehicle to offer courses and programs that have not been offered off-campus for various reasons, including distance and budgetary constraints.

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 preparatory courses, or (3) function as college placement courses. These opportunities are especially numerous in rural areas where many secondary agricultural education programs are located (Beckner & Barker, 1994).

In this regard, an introductory animal science course that the University of Kentucky has offered via AG\*SAT enables high school students in that state (1) to meet graduation requirements and (2) when they attend a Kentucky university, receive college credit for the course. Currently, this option is not available nationally or internationally. However, the dissemination of such courses via

AG\*SAT and similar distance education systems will enhance the capacity of agricultural and extension educators to meet the needs of contemporary society. Such an option can expand the range of options for secondary programs that have recently adopted a stronger agricultural science and technology focus.

### **Recommendations**

The findings prompt two recommendations that are especially germane for members of the American Association for Agricultural Education. The recommendations are predicated upon the fact that major reductions have occurred in the number of faculty who have primary responsibilities in teacher education as departments of agricultural education have diversified to include more faculty with responsibilities in areas such as extension education and communications (Bowen & Radhakrishna, 1991). In a related vein, similar reductions have occurred in terms of the number of state supervisors of agricultural education.

Consequently,

1. agricultural and extension education departments should develop consortia through which distance education that 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. 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 more noncredit and extension programming for audiences beyond the traditional 18-22 year old category.

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