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Distance Education in Agricultural Economics: Perceptions of Department Heads

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Heads of agricultural economics and agribusiness departments across the United States are surveyed to develop an inventory of distance education (DE) offerings by their departments. Perceived challenges, strategies for use, and future plans for DE are assessed. While the majority of the responding departments offer DE, the department heads believed that faculty time costs to develop/deliver DE are high relative to traditional delivery and that both strategic plans for implementing DE and financial incentives for faculty to adopt DE are lacking. The department heads did, however, have positive views about the technological ability of students to use distance courses.

Key Words: distance education

JEL Classifications: A2—Economics Education and Teaching of Economics

Introduction and Objectives

The development of distance education (DE), has, in large part, been driven by advances in communication technologies, that is, radio, television, and the Internet. These technological advances have prompted wildly enthusiastic predictions of both growth in distance education and fundamental changes in the nature of higher education. An overview of distance education development can be found in Barkley. To date, these technological changes have proven more evolutionary than revolutionary (Barkley; Moore 1997, 2003). However, each successive advance brings DE that much closer to being able to replicate the instructional methods traditionally employed in on-campus courses. The distinction between DE and on-campus instruction has also been blurred by the use of technological advances associated with the Internet in on-campus courses, primarily through asynchronous communication and online delivery of instructional material (Dahlgran; Howell, Williams, and Lindsay). In any event, the broad-based

appeal of these new technologies is expected to increase demand for DE not only among its traditional clientele, that is, place-bound adult students, but also among on-campus students. The advantage of DE to traditional students lies primarily in increased convenience, as DE is now directed not only at students distanced by geography but also at those distanced by time.

The objective of this study is to provide a snapshot of the increased role of DE within agricultural economics departments. More specifically, this study develops an inventory of DE offerings by agricultural economics and/or agribusiness departments across the United States, measures perceived challenges to offering DE, assesses strategies for use, and ascertains departments' plans for future DE offerings. The role of DE across the spectrum of undergraduate courses, graduate courses, and extension programs is also analyzed. To obtain information required for the study, heads of agricultural economics and/or agribusiness departments across the United States were surveyed by mail to obtain their percep-

tions of the types of distance offerings, including course topics and levels; the primary users of the department's distance materials; whether any distance offerings have been dropped and why; plans for future distance offerings; the adequacy of financial resources and technical support for distance offerings; faculty perceptions of DE and reward systems for authoring and offering distance materials; student or user learning through distance formats; and departmental strategies for using DE. However, prior to discussing the implementation of and responses to this survey, some background on DE is provided, including a review of relevant research.

Previous DE Research

DE has been defined as "institution-based, formal education where the learning group is separated, and where interactive telecommunication systems are used to connect learners, resources, and instructors" (Keegan). While the origins of DE can be traced back to the early 1800s, the nation's colleges and universities did not begin offering DE until the advent of the rural mail delivery system in the late 1800s. For overviews of the development of distance education, see Holmberg, Keegan, and Moore (2003); for an overview of the development of online education, see Harasim. In recent years, for-credit DE courses have become common in higher education with 88.7% of public four-year institutions and 39.4% of private four-year institutions offering these courses in 2000–2001 (Waits and Lewis).

The expansion of DE offerings has affected both graduate and undergraduate programs. In case studies of agriculturally related institutions of higher education offering agriculturally related DE programs, Roberts, Irani, Lundy, and Telg found that about 28% offered distance undergraduate courses, 22% offered distance graduate courses, and 50% offered both. Roberts and Dyer indicate that among agricultural education programs, two-thirds offered distance undergraduate courses, over 80% offered distance graduate courses, and less than 30% offered distance in-service training.

A department may choose to offer DE courses for a variety of reasons. In a U.S. Department of Education study, the most often cited "very important" reasons for offering DE courses were reducing time constraints for students, providing courses at convenient locations, and increasing the institution's access to new audiences (Waits and Lewis). DE may be a way for programs to "round out" course offerings. Schmidt, Miller, and Carter report that a survey of administrators responsible for agricultural academic programs at land grant universities were interested in sharing courses with other schools. In the longer term, DE could limit the need for additional brick-and-mortar classrooms in times of increasing demand and stable or shrinking state and federal education budgets (Howell, Williams, and Lindsay).

Students choose DE primarily because of the "convenience, flexibility and adaptability of this mode of education to individual students' needs" (Holmberg, p. 13). For example, students enrolled in a DE degree program in agricultural science and technology cited geographic constraints due to family or employment and flexibility of classes as their primary reasons for choosing DE (Mink and Moore). Similarly, Moore and Wilson report that convenience was a primary motivator for graduate students enrolling in an online course in agricultural and extension education. In a survey of agricultural science graduates, Nti and Bowen found that respondents were interested in taking DE courses for professional development reasons and for an advanced degree. They also found that the respondents interested in participating in DE courses tended to be older and have a stronger preference for studying on their own. The Roberts and Dyer study indicated that agricultural education department heads believed that only about 24% of students enrolled in their DE courses were full-time students. Taken together, these results suggest that new student audiences are being served by DE courses and that students enrolled in distance courses may have different preferences for course formats than those enrolled in traditional courses.

While large numbers of institutions are offering DE courses, most offer a fairly limited number of DE courses. As of 2000–2001, about half of the higher-education institutions offering DE courses offered 30 or fewer. Furthermore, only about 19% of two- and four-year institutions offered degree or certificate programs to be completed entirely through DE (Waits and Lewis). These results suggest that distance courses may be viewed as meeting certain niche needs within programs or that departments may be “testing the DE waters” before implementing additional courses. Alternatively, resource constraints, such as faculty time, may have limited the ability to offer DE courses.

The decision to adopt DE with limited faculty and staff time and budget resources is a complex one. The costs and benefits of traditional delivery of on-campus courses or extension programming must be weighed against those of distance delivery. These financial costs and benefits are considered by Burton within the framework of a cost-benefit analysis of a DE course. According to Roberts and Dyer, over half of the agricultural education department heads indicated that a barrier to DE was faculty time constraints. Similarly, the U.S. Department of Education study found that 44% of institutions with no plans to expand DE offerings believed that concerns about faculty workload affected this decision to a moderate or major extent.

These concerns appear to be well founded. A study conducted at the University of Florida’s Food and Resource Economics Department covering the period 1998 to 2002 attempted to quantify the additional costs associated with offering DE courses in its programs (Sterns, Wysocki, Comer, Fairchild, and Thornsbury). Estimates were that the average additional costs associated with DE compared with on-campus courses were \$16,631 per course and \$1,661 per student. Similarly, in a National Education Association survey of faculty involved in distance learning, it was found that 53% spent more hours per week preparing and delivering their distance learning course than they did for

a comparable traditional course, as compared to only 22% who indicated they spent fewer hours on distance courses (Abacus Associates). The study by Roberts and Dyer suggests that while nearly all agricultural education faculty are provided access to training for authoring and delivering distance courses, less than a third are given additional support for developing or teaching courses. For example, less than 17% indicated additional compensation for developing distance courses. Maguire provides a review of various factors that promote or dissuade faculty from participating in DE, and McLean proposes strategies for how to address faculty concerns.

From a survey of 62 department chairs in Colleges of Agriculture in Land-Grant Universities, Schauer, Rockwell, Fritz, and Marx found that issues related to faculty, technology, and setting DE direction have the most impact on department chairs’ decisions to implement distance courses and programs. The chairs were somewhat less concerned with finances, student issues, quality and effectiveness, policy and governance, and regulatory and legal issues related to distance courses. Workload issues related to development and delivery, faculty incentives to integrate DE technology, and compensation for course development and delivery were the primary concerns related to faculty. Technology concerns included technology support for faculty, appropriateness of technology for program and pedagogy, and reliability of technology supporting DE courses. Primary concerns regarding setting DE direction included the need for a shared vision (buy-in) by faculty of the need for DE, leadership within the department to pursue DE, and development of appropriate department plans for DE.

These concerns should be viewed in light of the conditions that are necessary for providing a high-quality DE program. Michael G. Moore, editor of the *American Journal of Distance Education*, asserts that the characteristics of successful distance programs include a division of labor between content specialists, instructors, and technologists; the use of a wide

range of media to capitalize on the strengths of each; substantial investment in program design and production; frequent monitoring of student and instructor performance, with administrative intervention to correct malfunctions in course design or instruction when triggered by monitoring data; both preliminary and continuing training in DE for all members of the teaching institution; and institutional specialization in "niche markets," with programs delivered at scale to recoup investments (Moore 2004). Notable among the characteristics cited by Moore are specialization of functions, substantial investment, continuing training, and specialization into niche markets.

The concerns relevant to the decision to offer extension programming through DE are somewhat different. In a study of extension agents' views on distance extension programming, the major impediments to distance extension programming were concerns related to the client's ability to connect to the Internet and the possession of adequate computer technology to participate in the DE program (Dromgoole and Boleman). Somewhat lesser concerns were the costs of developing high-quality programs that can be delivered at a distance and clientele acceptance of distance methods. Some of the major perceived benefits to offering extension programming through DE were savings in travel time and expense and the ability to deliver programs to people in different places. Additional benefits included more convenience to audiences and user friendliness.

Finally, a comparison of the results of this study can be made to an earlier survey of agricultural economics department heads. The earlier study indicated that in 1999, 35% of the responding departments offered distance courses (Weldon, Covington, Long, and Connor). The projections were that, by 2003, 90% of these departments would be teaching courses using distance methods. Similarly, by 2003, it was anticipated that over half the departments would be teaching courses via the Internet. A total of 66 courses were taught via distance among the responding departments in 1999. This total was expected to grow to 160

by 2003. The results from the study also projected that, while the Internet would be the most commonly used method of delivering distance academic courses, interactive video, video, and satellite would be nearly as commonly used by 2003.

Data Collection and Analysis

In September 2006, 90 department heads of agricultural economics and/or agribusiness across the United States were sent a mail survey. Approximately one week later, a reminder note was sent. The following week, a second survey was sent to all those who had not yet responded. A total of 49 surveys were returned for a response rate of 54.4%. The survey covered a range of topics, including current and projected distance course offerings and extension programming, general views on DE, users of the DE offerings, abandonment of DE offerings, adequacy of financial resources and technical support, faculty perceptions of DE, reward systems for authoring and offering distance materials, student learning through distance formats, and departmental strategies for using DE.

The data are summarized using two measures. For categorical variables, percents and frequencies of occurrences are used to summarize the responses. For continuous variables, mean responses are presented. *T*-tests are used to statistically test differences between means. Differences in mean ratings on sets of issues are tested using paired *t*-tests, $t = (\bar{x}_1 - \bar{x}_2)/(s^2/n)^{1/2}$. Also, *t*-tests are used to test for differences in means of characteristics across DE variables, such as whether the department offered distance courses or planned to expand their offerings. Under the assumption of equal variances, the calculated *t*-statistic is $t = (\bar{x}_1 - \bar{x}_2)/\{s^2[(1/n_1) + (1/n_2)]\}^{1/2}$, where s^2 is the pooled variance, such that $s^2 = [(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2]/(n_1 + n_2 - 2)$ (SAS Institute 2006). If the variances are not equal, then the calculated *t* statistic is $t = (\bar{x}_1 - \bar{x}_2)/(w_1 + w_2)^{1/2}$, where $w_1 = [(s_1^2)/(n_1)]$, $w_2 = [(s_2^2)/(n_2)]$ and $df = [((w_1 + w_2)^2)/((w_1^2)/(n_1 - 1) + (w_2^2)/(n_2 - 1))]$. Equalities of variances are tested using *F*-tests.

Results

Distance Courses in Undergraduate or Graduate Curriculum

About 59.2% of the department heads indicated their departments currently offered distance courses in their undergraduate or graduate curriculum ($n = 49$). Among the responding departments offering distance courses, an estimated 1,707 students are enrolled in all courses across all responding departments. The average aggregate enrollment in distance courses per school offering distance courses is 63.2, with a minimum of five and a maximum of 350 ($n = 27$). About 70.4% of these schools have 50 or fewer total enrollments in all their distance courses.

A total of 85 distance courses are offered by the responding departments. Enrollment information was provided for 78 of these courses. Among those offering distance courses, the average number of course offerings is 2.9 per department ($n = 29$). The minimum number offered is one, and the maximum is nine. About 74.1% offer three or fewer courses. On a per course basis, the average enrollment is 21.9 students per course across the 78 courses. About 34% of the courses have less than 20 students enrolled. Nearly all have less than 50 students enrolled.

Out of the 85 courses taught via distance, the majority, over 64%, are at the senior or graduate level. More specifically, the levels of the courses taught are freshman, 10.6%; sophomore, 9.4%; junior, 15.3%; senior, 28.2%; and M.S. or Ph.D., 36.5%. The most commonly offered course topics are agribusiness management, marketing, introductory courses, and quantitative methods. However, a fairly wide variety of topic areas are covered through distance courses. The most prevalently used method of delivery is asynchronous Web format, with prerecorded lectures on video or slides with audio. Many also use e-mails, chat rooms, or discussion threads as supplements for class discussion. A few used two-way interactive video as a delivery method.

About 77.8% of the departments offering distance courses have local or on-campus

students in the department's degree program enrolled in their distance courses ($n = 27$). About 63.0% have students who are in their degree program but located elsewhere, and about 63.0% have students who are local but in other degree programs ($n = 27$). Only about 55.6% have students who are not in their degree program and who are located elsewhere ($n = 27$).

Over half, 53.2% ($n = 47$), have plans to begin or expand offerings of distance courses as part of their curriculum. Of those currently offering DE courses, 58.6% plan to expand ($n = 29$), while only 27.8% of those currently not offering DE plan to begin doing so ($n = 18$). The levels of planned offerings are primarily at the undergraduate level (77.3%) and the M.S. level (59.1%, $n = 22$). Less than 10% planned new offerings of DE Ph.D. courses ($n = 21$). Among those with plans to expand, most (63.6%) plan to expand only in selected courses, although 22.7% ($n = 22$) currently plan on offering an entire degree program via distance. Commonly cited reasons for not expanding or offering DE courses included lack of faculty interest, not enough resources, and lack of demand for distance courses.

About 18.4% ($n = 49$) of the department heads indicated that their department has stopped offering one or more distance courses in its undergraduate or graduate curriculum. Among those departments currently with distance courses, 17.2% ($n = 29$) have abandoned one or more courses, while 20% of those without distance courses have abandoned one or more distance courses ($n = 20$). A closer look at the responses of those indicating their department has abandoned one or more distance courses reveals that some of the most commonly cited reasons were that there was a loss of the faculty member or members who were teaching a distance course, financial constraints were too high, the department found that most students using the courses were on campus, or the courses had insufficient enrollment.

About 62% of the department heads stated that their institution did not charge special technology fees per credit hour on distance

courses ($n = 42$). Of the 38% of the institutions that did charge fees, some or all of the fees were returned to the department about half the time.

When asked how their departments marketed their distance courses, many respondents indicated that they relied on word of mouth, their institution's continuing education marketing efforts, Web pages, and student registration booklets or timetable schedules. A lesser number of the departments use more aggressive marketing methods, such as visiting trade shows, visiting companies, brochure or flyer mailings, posters, and e-mails to students and advisers.

Distance Extension Programming

Approximately 33.3% of the respondents indicated that their departments offer extension program workshops or educational materials (noncredit) through DE methods ($n = 48$). Of the 30 departments with extension faculty, about half stated they offered distance extension programming. The total number of estimated users was 23,663, with an average of 2,151 users per program ($n = 11$). Topic areas covered in distance extension programs include farm and business management, risk management, marketing, economic development, and in-service training. The targeted client groups for these programs include farmers, business owners or managers, extension agents, government agency personnel, and local leaders. Delivery methods include the Internet and two-way interactive video, with use of two-way interactive video being more predominant than in academic instruction. The distance-based extension programs are marketed through extension agents/field staff, conferences or workshops, listservs, mailing lists, newspapers, brochures, and Web sites.

Among the departments with distance extension programming, 78.6% indicated they had out-of-state users of these materials ($n = 14$). About 25% of the respondents stated that their departments have plans to begin or expand their offerings of distance extension programming ($n = 44$). Among departments

with extension full-time equivalent (FTEs), this percentage was about 32.1% ($n = 28$). Among those with existing distance programs, about 42.9% plan to expand ($n = 14$). However, among those without existing distance programs, only about 17.2% plan to initiate distance extension programs ($n = 29$). Very few department heads indicated their departments had abandoned any distance extension programming. About 79% stated that their institutions did not charge extra fees for distance extension program workshops or materials ($n = 38$).

Views on Faculty Resources for Distance Education

The mean levels of respondent agreement with statements regarding faculty resources are shown in Table 1. Department heads most strongly agreed with the statements that faculty time costs of developing and delivering both distance courses and distance extension materials are high relative to the costs of developing and delivering traditional courses and traditional extension materials. The respondents most strongly disagreed with statements that their institution offers faculty compensation for DE development/delivery, that their institution takes the development of DE materials into account in tenure/promotion decisions, or that their department has sufficient faculty resources to integrate DE technology.

Technology Support and Distance Education

As shown in Table 2, the department heads, on average, only moderately agreed that their institutions provided sufficient technology support for students to participate in distance courses and for authoring and maintaining DE materials. They were largely neutral or undecided as to whether their institution provided either sufficient support staff to assist with the development and maintenance of DE materials or adequate protection of intellectual property associated with the development of distance instructional materials.

Table 1. Views Regarding Faculty Resources and Distance Education

Statements Regarding Faculty Resources	Mean (<i>n</i> = 37) 1 = Strongly Agree, 5 = Strongly Disagree ^a
Faculty time costs to develop/deliver distance courses are high relative to traditional courses	1.9 a
Faculty time costs to develop/deliver distance extension educational materials are high relative to traditional materials	2.1 a
Faculty are aware of new distance delivery alternatives and technologies	2.6 b
Faculty are accepting of distance education	2.9 b,c
Institution offers faculty compensation for distance education development/delivery	3.3 c,d
Development of distance education materials is taken into account in tenure/promotion decisions	3.4 c,d
Department has sufficient faculty resources to integrate distance education technology	3.6 d

^a Like letters indicate that the means were not significantly different from each other at the 95% confidence level.

Strategies for Use of Distance Education

The mean levels of respondent agreement with statements regarding strategies for use of DE are displayed in Table 3. Respondents were in moderate agreement with statements about future expansion of distance offerings in extension programs and undergraduate programs and about the usefulness of a consortium of distance academic and outreach programs. They also moderately agreed that Web-based distance delivery is more appropriate for field or specialty classes than core curriculum classes. On balance, they slightly disagreed with the statement that distance graduate course offerings from their department would increase in the future and that

Web-based DE delivery is more appropriate for graduate than undergraduate courses. The department heads, on average, did not agree that their departments had either effective marketing programs for DE courses and educational materials or strategic plans for DE.

Views on Student/User Learning and Distance Education

As shown in Table 4, respondents generally agreed that students at their institutions have sufficient technology literacy to participate in distance courses. They only marginally agreed that enrollment in DE for-credit courses tends to include more off-campus or nontraditional

Table 2. Views on Technology Support and Distance Education

Statements on Technology Support and Distance Education	Mean (<i>n</i> = 49) 1 = Strongly Agree, 5 = Strongly Disagree ^a
My institution has sufficient: Technology support for students to participate in distance courses	2.5 a
Technology supporting authoring and maintenance of distance education materials	2.6 a
Support staff to assist with and maintain distance education materials	2.9 b
Protection of intellectual property associated with development of distance instructional materials	2.9 b

^a Like letters indicate that the means were not significantly different from each other at the 95% confidence level.

Table 3. Views on Strategies for Use of Distance Education

Statements on Strategies for Use of Distance Education	Mean (<i>n</i> = 33) 1 = Strongly Agree, 5 = Strongly Disagree ^a
My department's distance extension program offerings for clients will increase in the future	2.5 a
A consortia of distance extension educational programs offered across a group of institutions would be more efficient than each institution developing distance extension programming independently	2.5 a
Distance undergraduate course offerings from my department will increase in the future	2.7 a
Web-based distance education delivery is more appropriate for field or specialty classes than core curriculum classes	2.8 a,b,c
A consortia of distance courses offered across a group of institutions would be more efficient than each institution developing them independently	2.8 a,b,c
Distance graduate course offerings from my department will increase in the future	3.1 b,c
Web-based distance education delivery is more appropriate for graduate than undergraduate courses	3.2 b,c
My department has effective programs for marketing distance courses and educational materials	3.7 d
My department has developed a strategic plan for incorporating distance education into its academic curriculum and/or extension programming	3.8 d

^a Like letters indicate that the means were not significantly different from each other at the 95% confidence level.

students and that clients served by extension programming have sufficient technology literacy to participate in distance extension workshops.

Views on Financial Resources and Distance Education

The department heads' views on financial resources are presented in Table 5. In general,

the department heads indicated that their departments did not have a sufficient budget for developing DE materials. The department heads were generally neutral as to whether financial resources to fund DE at their institutions were likely to increase in the future and as to whether faculty in their departments have used internal and/or external grants to develop DE materials.

Table 4. Views on Student/User Learning and Distance Education

Statements Regarding Student/User Learning and Distance Education	Mean (<i>n</i> = 41) 1 = Strongly Agree, 5 = Strongly Disagree ^a
Students at my institution have sufficient technology literacy to participate in distance courses	2.0
Enrollment in distance education for-credit courses tends to include more off-campus or nontraditional students	2.6 a
Clients served by extension programming have sufficient technology literacy to participate in distance extension workshops	2.9 a

^a Like letters indicate that the means were not significantly different from each other at the 95% confidence level.

Table 5. Views on Financial Resources and Distance Education

Statements Regarding Financial Resources and Distance Education	Mean (<i>n</i> = 42) 1 = Strongly Agree, 5 = Strongly Disagree ^a
Financial resources to fund distance education at my institution will likely increase in the future	3.0 a
Faculty in my department have used internal and/or external grants to develop distance educational materials	3.1 a
My department has sufficient budget to develop distance educational materials	3.7

^a Like letters indicate that the means were not significantly different from each other at the 95% confidence level.

Department Characteristics and Distance Education

The survey also included several questions regarding department characteristics. The department heads were asked about faculty size; FTE allocations to extension, teaching, and research; and number of faculty involved in DE. The average number of faculty members per department was 19.8 (*n* = 49). The average FTE allocations across the departments were 34.0% research, 14.8% extension, 47.8% teaching, and 3.4% administrative (*n* = 46). On average, 2.8 faculty members were involved in DE (*n* = 48). If all departments are used, including those without distance programs, the average share of faculty involved in DE is 16.5% (*n* = 48). If only those departments with distance programs are included, the average share is 22.6% (*n* = 35). The average number of undergraduate majors was 235.0 (*n* = 49). The average number of undergraduate majors per teaching FTE was 26.2 (*n* = 46). The average number of M.S. students was 23.0, and the average number of Ph.D. students was 17.6, for an average total number of graduate students of 40.6 (*n* = 49).

Number of faculty, number of teaching FTEs, number of undergraduate majors, number of graduate students, and number of undergraduates per teaching FTE were compared across whether a department did or did not offer distance courses. None of these measures differ significantly across whether the department offered distance courses, except for the number of graduate students.

The departments offering distance courses average 30.9 graduate students, while those not offering distance courses average 54.8 students (calculated *t*-statistic= 2.26, unequal variances, *df* = 30.4, significant at α = .05). When these same characteristics are examined across plans to expand offerings, no statistical differences emerge at the 95% confidence level.

Since departments offering distance courses tended to have fewer graduate students, an analysis of the relationship between types of students enrolled in distance courses and department size was conducted. Departments were divided into those with less than 40 graduate students and those with 40 or more. A couple of interesting patterns emerge. A higher percentage of the departments with less than 40 graduate students (69.2% compared to 42.9%) had students who were on campus but not in the department's degree programs enrolled in their DE courses. Similarly, a higher percentage of the departments with fewer graduate students (76.9% compared to 50%) had students enrolled in their DE courses who were neither in their degree program nor locally located. These results suggest that smaller departments may be using distance courses to reach students outside their degree program.

The number of faculty and the number of extension FTEs were also compared across participation in distance extension programming and plans. The average faculty size (25.3 members) is significantly larger for departments offering distance extension programs than for those not (16.9 members) offering them (calculated *t*-statistic= 2.63, equal var-

iances, $df = 46$, significant at $\alpha = .05$). Also, the average number of extension FTEs (7.0 FTE's) is higher than for departments not offering (3.2 FTEs) distance extension programming (calculated t -statistic = 2.0, equal variances, $df = 43$, significant at $\alpha = .05$). No significant differences in faculty numbers or extension FTEs were found across plans for expanding distance extension programs.

Conclusions

The results from this study indicate that most departments, about three-fourths, offer distance education materials, whether through academic for-credit courses or through distance extension programming. About 60% currently offer distance courses in their undergraduate or graduate curriculum, which is considerably lower than the 90% projected by department heads to be offered by 2003 in the Weldon et al. study. However, that study's definition of distance courses included courses taught totally off campus. When the projection from that same study for offering courses via the Internet, about 50%, is used as the basis for comparison, the percent offering distance courses as indicated in this study is much closer.

In general, the department heads believed that faculty time costs to develop and deliver distance courses and extension program materials are high relative to traditional delivery. In addition, department heads believed their department had insufficient faculty resources and budget to integrate distance technologies. This finding regarding faculty resource concerns reinforces the results of studies such as Schauer, Rockwell, Fritz, and Marx. While the department heads believed faculty and budget resources to be inadequate, they also had generally positive views regarding the technological literacy of the students at their institution to use distance courses.

Interestingly, the most popular methods of distance delivery were different for academic courses than for extension programming. For-credit courses tended to be asynchronous Internet delivered through courseware, while extension programming was often two-way interactive video. From the 1999 study by

Weldon et al., video, satellite, and interactive video were projected to be used nearly as often as the Internet for delivering distance courses by 2003. This result suggests that a "one method fits all" approach to DE is not what is being adopted and that distance delivery methods are adapted to their respective niche markets. Comparison with the earlier study also suggests that departments may have adapted their expectations for how distance materials will be delivered.

Surprisingly, whether or not a department offered distance courses did not appear to be related to size of the undergraduate program or the number of either faculty members or teaching FTEs. However, departments offering distance courses did tend to have lower graduate enrollments. This result suggests that these departments may be using distance courses to access new markets for their graduate programs. Similarly, a larger percentage of the graduate degree programs with lower enrollments may be using distance courses to reach non-degree program students as compared to the graduate degree programs with higher enrollments.

The results from this study indicate that extension programs with more faculty members and FTEs are more likely to conduct extension programming via distance methods. Almost 80% of the department heads whose departments offered extension programming via distance methods believed that their distance offerings had out-of-state users, suggesting that these programs may be reaching new audiences.

Over half the departments planned to expand either their for-credit distance offerings or their distance extension programming. Most of the departments planning additional distance offerings are already offering distance materials. Of those departments already offering either distance for-credit courses or extension programming, over 60% planned to expand. Considerably lower, only about 40%, of those without existing distance programs planned to initiate them. This suggests that the rate of adoption of distance programs by departments is likely to slow in the next few years. Thus, it seems likely that

the immediate future of DE will be one of consolidation as departments already offering DE expand, maintain, or refine their offerings.

Several findings from this study suggest DE, for the most part, is a grassroots effort from the faculty up. First, when department heads were asked why they did not plan to expand, a commonly cited reason was that there was insufficient faculty interest. Second, the loss of a faculty member who was a participant in the DE program was often given as a reason for discontinuing DE efforts. Perhaps most important, department heads generally did not believe that their department had either a strategic plan for incorporating DE into their programs or an effective marketing program for its distance courses and educational materials. Interestingly, while DE appeared to be largely a grassroots effort on the behalf of faculty, the department heads generally did not believe that faculty were compensated for these efforts or that participation in DE was used in tenure and promotion decisions.

Technological advances have led to a rapid diffusion of DE offerings among higher-education institutions, and, as the results show, among agricultural economics departments, this has been no different. However, the rate of adoption appears to be slowing, in part because of a lack of strategic direction or financial incentives from university and department administration. Whether this hesitation reflects an inability to respond to a rapidly changing environment or a recognition of limited opportunities remains to be seen. Future research should focus on analyzing the opportunities for DE and the effects that pursuing these opportunities will have on agricultural economics faculty and departments.

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