

# Interest, Capacity, and Concerns Related to Distance Taught Courses



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## Abstract

Academic administrators in land grant colleges of agriculture are interested in sharing courses with other universities. Land grant universities also have considerable capacity to offer courses at both the undergraduate and graduate levels. As a result, significant opportunities exist for sharing agriculture related courses among land grant universities. To translate the opportunities into reality, a framework for sharing courses through distance education must be constructed. Besides forming partnerships based on interest and capacity, academic administrators will need to address concerns including the opportunity for students to interact with their instructor and one another, the overall quality of courses, the relevance of course outcomes, the academic integrity of students completing requirements at a distance, and the instructor's qualifications. In addition, a host of logistical issues must be addressed. To address the recommendations of this study and to determine implications for their institutions, administrators are provided a list of questions to consider.

## Introduction

Distance education is no longer a fad; it is a permanent fixture in education (Maeroff, 2003). Delivery of distance education began with correspondence by post and has evolved to include multiple telecommunication formats (Maeroff, 2003; Weber, 1999). The Internet has expanded distance education, making distance education a central part of institutions' offerings (Barone and Luker, 2000; Hurst, 2001; Rudestam and Schoenholtz-Read, 2002).

The Internet has changed more than course offerings to learners; it has revolutionized the university's role in providing an education through e-learning (Wallhaus, 2000). Today's universities are being asked to provide more curriculum, courses, information, and general knowledge with less social and fiscal support (Duderstadt, 1999). Dwindling

budgets and increasing costs are not the only risks universities are facing (Bonnen, 1998). Lifelong learning has become more and more popular, catching the attention of large corporations (Collis, 2002). Universities risk losing their lifelong learning market to those who are quicker to strike and have more funding to support the technology needed to provide such offerings (Collis).

Traditionally, universities have strived to keep their autonomy (Baus and Ramsbottom, 1999). Institutions are hesitant to respond to distance learning possibilities because they may have to give up some autonomy to become an 'open university' (Tomlinson-Keasey, 2002). Open universities offer programs through a combination of delivery methods such as on-campus, on-line, via video, and via World Wide Web (Tomlinson-Keasey). A twist to the idea of an open university is the introduction of Open Courseware. Open Courseware, developed by MIT, is an example of sharing information among universities or anyone who wishes to log on and view the information via the Internet (Rappa, 2003).

Sharing is not a new concept in higher education. Universities have been creating and successfully incorporating consortia for many years (Baus and Ramsbottom, 1999; Larrance, 1999; Strandness, 1999). Sharing resources through libraries is common among colleges and universities, cracking the door of opportunities for the sharing of various other services, such as cross registration through distance education (Glazer, 1982). Cross registration is one way to increase educational opportunities provided by universities (Strandness, 1999; Wallhaus, 2000).

Some universities are using distance learning technologies to address contemporary issues and challenges for higher education. Texas Tech University and Texas A& M University teamed up to offer the Doc @ Distance program (Kelsey et al., 2002). This program offers a doctoral degree program to individuals through distance education without disrupting their careers (Kelsey et al.). The first group of eighteen students started in the fall of 2000

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and were expected to complete the program in 2004 (Kelsey et al.). The University of Idaho and the College of Southern Idaho have collaborated to offer a bachelor's degree in three agricultural areas. When other two year colleges expressed interest, leaders from Colleges of Agriculture at the University of Idaho, Oregon State University, Washington State University, and several community colleges formed the Tri-State Agricultural Distance Delivery Alliance consortia, sometimes referred to as TADDA (Anderson et al., 1998). Courses are developed separately, but are accepted by the three degree-granting institutions (Anderson et al., 1998). These are just two of a growing number of sharing arrangements focused on agriculture at the college level.

A few examples of consortia and collaboration in colleges of agriculture have been recorded. However, research on sharing courses among land grant universities, especially in colleges of agriculture is limited. The extent to which decision makers in land grant universities are interested in sharing courses through distance education is not known. In addition, priority subject areas for delivery, preferred delivery formats, institutional capacity, and concerns about sharing are unknown.

## **Purpose and Objectives**

The purpose of this study was to seek information from decision makers at land grant universities about their interest in and capacity to receive and deliver distance education courses in agriculture. Objectives of the study were to describe academic administrators--

1. Level of interest in sharing specific courses at the undergraduate and graduate levels;
2. Perceptions of their universities' capacity to share courses at the undergraduate and graduate level;
3. Preferred method of providing and receiving distance education courses in agriculture; and
4. Concerns related to institutional sharing of courses.

## **Methods**

The population for this study included administrators responsible for academic programs at forty-six 1862 land grant universities listed in the August 2002 "Deans and Directors of Academic Programs in Schools and Colleges of Agriculture, Agriculture and Life Sciences, or Agriculture and Natural Resources."

A questionnaire was developed and then converted to a web-based survey by coding in HTML, ASP, and VBScript. The visual layout was developed using Macromedia DreamWeaver (B. Brueland, personal communication, June 23, 2004). When a completed questionnaire was returned by the respondent the data were automatically stored in an MS Access database. The data were then exported to

SPSS for analysis (B. Brueland, personal communication, June 23, 2004).

To establish content and face validity, multiple expert opinions were sought and integrated into the questionnaire. These experts included one Associate Dean of Academic Programs, the Director of Distance Education, an Associate Professor in Agricultural Education and Studies, and the Program Coordinator of Continuing Education and Communication Services at Iowa State University. Panelists were given the purpose of the study and a description of the intended participants. They were asked to add, delete, and/or change items to more adequately accomplish the purpose of the study.

A field test was conducted with academic administrators at twelve non-1862 land grant universities in July 2003. The academic administrators were contacted by email and given a URL link to the survey site and an individual access code. All contacts were informed that their participation was voluntary. Four (25%) of the twelve academic administrators participated in the field test. Comments and questions provided by the field test participants were used to improve the questionnaire. One improvement was the creation of a printable version. Respondents had the ability to preview the questionnaire and make a choice of whether to participate. This also allowed the contact to gather opinions from others in their university who might be better able to answer some questions. The electronic questionnaire was also modified to allow academic administrators to back up one page and review their answers for correctness.

The academic administrators were contacted via email on September 19, 2003. This email message stated the purpose for the study, informed the academic administrators that their participation was voluntary, and asked them to indicate whether or not they wished to participate. Twenty-five (53.3%) administrators responded positively to an invitation to participate and were sent an email including a URL address and an individual access code. Two (4.3%) administrators chose not to participate. The 19 (41.3%) administrators who had not responded to the initial invitation were considered to be non-respondents. The group of non-respondents was sent a follow-up email, including a URL address and an individual access code on October 8, 2003. The final email was sent on October 28, 2003, to any contact who had received an email with a URL and access code and had not yet responded. Twenty-seven usable surveys were completed. The response rate was 58.7%. Results should not be generalized beyond the group of 27 respondents. Of the 27 individuals, 20 (74.1%), held the title of associate dean. The remaining seven (25.9%) individuals consisted of one (3.7%) academic coordinator, one (3.7%) assistant director of academic programs, one (3.7%) college coordinator of instructional computing, one (3.7%) coordinator of agriculture extension education, one (3.7%) dean, one (3.7%) director of distance education and one

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(3.7%) professor. This group will be referred to as academic administrators throughout the paper.

## Results and Discussion

**Objective 1:** Describe academic administrators' level of interest in sharing specific courses at the undergraduate and graduate levels.

The number of undergraduate students enrolled in colleges of agriculture represented in this study ranged from a low of 627 to a high of 3,564 with a mean of 1,704 and a standard deviation of 738. The number of graduate students enrolled in the same colleges of agriculture ranged from a low of 134 to a high of 1,015 with a mean of 448 and a standard deviation of 232.

Tables 1 and 2 show the academic administrator's interest in sharing specific undergraduate and graduate level courses through distance education. The academic administrators were asked to indicate their level of interest in sharing courses by selecting one of the following options "not interested in receiving or providing a course related to the subject area," "interested in providing a course in the subject area," or "interested in receiving a course in the subject area." Table 1 provides results for undergraduate courses. Table 2 shows results for the graduate courses. Regarding the undergraduate data, the number wishing to provide was notably higher than the number wishing to receive in three of the twelve subject areas. Those subject areas were Crop Production, Soil Science, and Introduction to Horticulture. Meteorology and Precision Farming Systems were two subject areas where more interest was indicated in receiving courses. In a majority of the subject areas (7 of 12), the number of those wishing to provide and receive courses was relatively equal. The seven subject areas were Introduction to Animal Science, Feeds and Feeding, Animal Breeding, Applied Nutrition, Management of Insect Pests, Renewable Resources, Wildlife and Agriculture,

General Microbiology, Introduction to Insects, and Economics.

In two of the nineteen graduate level subject areas, the number wanting to provide courses greatly exceeded the number wishing to receive. These were Ag Management and Ag Policy. Academic administrators showed more interest in receiving than in providing ten of the nineteen subject areas. The ten subject areas were Ag Biochemistry, Manure Management Systems, Renewable Resources, Weed Science, Forage Crop Management, Crop Production, Advanced Soils, Climate and Crop Growth, Crop Improvement, and Animal Breeding. Seven subject areas were relatively equal in the number wishing to provide and receive. These areas were Ag Marketing, Ag Biotechnology, Ag Leadership and Group Dynamics, Integrated Pest Management, Applied Nutrition, Management of Insect Pests, and Statistics.

Academic administrators were asked to indicate their overall level of interest in sharing through providing and receiving courses via distance educa-

**Table 1. Level of interest in sharing undergraduate courses**

Subject	Interest					
	Not <sup>z</sup>		Provide <sup>y</sup>		Receive <sup>x</sup>	
	f	%	f	%	f	%
Introduction to Animal Science	14	56.0	6	24.0	5	20.0
Feeds and feeding	13	52.0	6	24.0	6	24.0
Precision Farming Systems	13	52.0	4	16.0	8	32.0
Crop Production	13	56.5	7	30.4	3	13.0
Soil Science	15	60.0	8	32.0	2	8.0
Meteorology	17	70.6	2	8.3	5	20.8
Introduction to Renewable Resources	12	48.0	7	28.0	6	24.0
Wildlife and Agriculture	12	48.0	6	24.0	7	28.0
General Microbiology	16	66.7	4	16.7	4	16.7
Introduction to Insects	14	58.3	5	25.0	4	16.7
Introduction to Horticulture	12	48.0	8	32.0	5	20.0
Economics	13	54.2	6	25.0	5	20.8

<sup>z</sup> Not interested in receiving or providing a course related to this subject area; <sup>y</sup> Interested in providing a course related to this subject area; <sup>x</sup> Interested in receiving a course related to this subject matter

**Table 2. Level of interest in sharing graduate courses**

Subject	Interest					
	Not <sup>z</sup>		Provide <sup>y</sup>		Receive <sup>x</sup>	
	f	%	f	%	f	%
Ag. Biochemistry	19	76.0	1	4.0	5	20.0
Ag. Management	12	50.0	8	33.3	4	16.7
Ag. Marketing	13	54.2	6	25.0	5	20.8
Ag. Policy	14	56.0	7	28.0	4	16.0
Ag. Biotechnology	14	58.3	4	16.7	6	25.0
Manure Management Systems	17	70.8	2	8.3	5	20.8
Ag. Leadership & Group Dynamics	9	36.0	9	36.0	7	28.0
Renewable Resources	16	66.7	2	8.3	6	25.0
Weed Science	15	62.5	3	12.5	6	25.0
Forage Crop Management	14	56.0	4	16.0	7	28.0
Crop Production	16	64.0	3	12.0	6	24.0
Advanced Soils	15	62.5	3	12.5	6	25.0
Climate & Crop Growth	16	66.7	2	8.3	6	25.0
Crop Improvement	16	66.7	2	8.3	6	25.0
Integrated Pest Management	14	58.3	4	16.7	6	25.0
Animal Breeding	16	66.7	2	8.3	6	25.0
Applied Nutrition	17	70.8	3	12.5	4	16.7
Management of Insect Pests	13	54.2	6	25.0	5	20.8
Statistics	17	70.8	4	16.7	3	12.5

<sup>z</sup> Not interested in receiving or providing a course related to this subject area; <sup>y</sup> Interested in providing a course related to this subject area; <sup>x</sup> Interested in receiving a course related to this subject matter

tion technologies. About one-fifth (22.2%) of academic administrators indicated great interest in providing courses to other universities, 37.0% indicated moderate interest, and 40.7% indicated some interest. No academic administrators indicated no interest in providing courses to other institutions. About one out of seven (14.8%) academic administrators indicated great interest in receiving courses from other institutions, 22.2% indicated moderate levels of interest, 59.3% indicated some interest and 3.7% indicated no interest.

The academic administrators were clearly interested in sharing courses. However, they had much greater interest in providing courses as opposed to delivering them. Perhaps this is a vestige of the traditional university desire to be autonomous (Baus and Ramsbottom, 1999).

**Objective 2:** Describe academic administrators' perceptions of their universities' capacity to share courses at the undergraduate and graduate level.

Tables 3 and 4 provide information on the population's capacity to share undergraduate and graduate courses respectively. Table 3 indicates the number of academic administrators with full capacity to offer an undergraduate course in a specific subject area range from one (3.7%) to six (22.2%). Subject areas with a low number of academic administrators indicating full capacity are Feeds and Feeding (3.7%), Precision Farming Systems (3.7%), Crop Production (3.7%), and General Microbiology (3.7%). The subject area with the highest number of academic administrators indicating full capacity is Soil Science (22.2%). The academic administrators responses indicate a surprisingly high number of undergraduate subject areas not offered. The highest percentage (66.7%) of academic administrators responded that a course in Meteorology was not offered. Nearly 50% of academic administrators indicated the lack of courses in five other subject areas. These five subject areas were Introduction to Renewable Resources (48.1%), Wildlife and Agriculture (48.1%), Precision Farming

Systems (44.4%), General Microbiology (44.4%), and Introduction to Insects (44.4%). Crop Production (34.6%), Introduction to Animal Science (29.6%), Feeds and Feeding (29.6%), Economics (25.9%), Soil Science (22.2%), and Introduction to Horticulture (22.2%) might be considered to be foundational courses typical of colleges of agriculture. Still more than 20% of academic administrators indicate their university does not offer a course in these subject areas.

Table 4 indicates the number of academic administrators' programs with full capacity to offer a graduate course in a specific subject area ranged from one (3.7%) to four (14.8%). Subject areas with a low number of academic administrators indicating full capacity are Ag Management (3.7%), Ag Policy (3.7%), Ag Biotechnology (3.7%), Manure Management Systems (3.7%), Forage Crop Management (3.7%), Crop Production (3.7%), Climate and Crop Growth (3.7%), Animal Breeding (3.7%), and Applied Nutrition (3.7%). The subject area with the highest number of academic administrators indicating full capacity was Integrated Pest Management (14.8%). Nearly 50% of academic administrators indicated the lack of courses in five other subject areas. These five subject areas were Manure Management Systems (66.7%), Ag Biochemistry (65.4%), Climate and Crop Growth (63.0%), Ag Leadership and Group Dynamics (55.6%), and Ag Biotechnology (51.9%). Thirteen of the subject areas were not offered by 25% to 50% of the institutions. These 13 areas were Renewable Resources (48.1%), Forage Crop Management (44.4%), Crop Improvement (40.7%), Statistics (40.7%), Ag Management (37.0%), Weed Science (37.0%), Animal Breeding (37.0%), Management of Insect Pests (37.0%), Crop Production (33.3%), Integrated Pest Management (29.6%), Ag Marketing (25.9%), Ag Policy (25.9%), and Advanced Soils (25.9%).

**Objective 3:** Describe academic administrators' preferred method of providing and receiving distance education courses in agriculture.

Table 5 shows academic administrators' preferred method of delivering and receiving distance education courses. Academic administrators were allowed to select more than one option. World Wide Web (WWW) was the most popular method for both providing (74.1%) and receiving (69.2%) courses. The least popular method for providing (11.1%) and receiving (11.1%) was DVD.

**Table 3. Capacity to share undergraduate courses**

Subject	Capacity							
	Not Offered <sup>z</sup>		Offered, Not Delivered <sup>y</sup>		Partial Capacity <sup>x</sup>		Full Capacity <sup>w</sup>	
	f	%	f	%	f	%	f	%
Introduction to Animal Science	8	29.6	16	59.3	1	3.7	2	7.4
Feeds and Feeding	8	29.6	15	55.6	3	11.1	1	3.7
Precision Farming Systems	12	44.4	11	40.7	3	11.1	1	3.7
Crop Production	9	34.6	12	46.2	4	15.4	1	3.7
Soil Science	6	22.2	12	44.4	3	11.1	6	22.2
Meteorology	18	66.7	7	25.9	0	0.0	2	7.4
Introduction to Renewable Resources	13	48.1	8	30.8	1	3.8	4	15.4
Wildlife and Agriculture	13	48.1	9	33.3	3	11.1	2	7.4
General Microbiology	12	44.4	11	40.7	3	11.1	1	3.7
Introduction to Insects	12	44.4	10	37.0	3	11.1	2	7.4
Introduction to Horticulture	6	22.2	13	48.1	4	14.8	4	14.8
Economics	7	25.9	12	44.4	5	18.5	3	11.1

<sup>z</sup> Course not offered in this subject area; <sup>y</sup> Course offered but not delivered by WWW, CD-ROM, and/or DVD; <sup>x</sup> Partially developed capacity to deliver course using WWW, CD-ROM, and/or DVD; <sup>w</sup> Fully developed capacity to deliver course using WWW, CD-ROM, and/or DVD.

**Table 4. Capacity to share graduate courses**

Subject	Capacity							
	Not Offered <sup>z</sup>		Offered, Not delivered <sup>y</sup>		Partial Capacity <sup>x</sup>		Full Capacity <sup>w</sup>	
	f	%	f	%	f	%	f	%
Ag. Biochemistry	17	65.4	7	26.9	0	0.0	2	7.7
Ag. Management	10	37.0	13	48.1	3	11.1	1	3.7
Ag. Marketing	7	25.9	16	59.3	2	7.4	2	7.4
Ag. Policy	7	25.9	15	55.6	4	14.8	1	3.7
Ag. Biotechnology	14	51.9	10	37.0	1	3.7	1	3.7
Manure Management Systems	18	66.7	8	29.6	0	0.0	1	3.7
Ag Leadership & Group Dynamics	15	55.6	7	25.9	3	11.1	2	7.4
Renewable Resources	13	48.1	12	44.4	0	0.0	2	7.4
Weed Science	10	37.0	12	44.4	3	11.1	2	7.4
Forage Crop Management	12	44.4	13	48.1	1	3.7	1	3.7
Crop Production	9	33.3	16	59.3	1	3.7	1	3.7
Advanced Soils	7	25.9	17	65.4	0	0.0	2	7.7
Climate & Crop Growth	17	63.0	9	33.3	0	0.0	1	3.7
Crop Improvement	11	40.7	14	51.9	0	0.0	2	7.4
Integrated Pest Management	8	29.6	12	44.4	3	11.1	4	14.8
Animal Breeding	10	37.0	15	55.6	1	3.7	1	3.7
Applied Nutrition	6	23.1	14	53.8	5	19.2	1	3.7
Management of Insect Pests	10	37.0	11	40.7	4	14.8	2	7.4
Statistics	11	40.7	10	16.7	4	14.8	3	11.1

<sup>z</sup> Course not offered in this subject area; <sup>y</sup> Course offered but not delivered by WWW, CD-ROM, and/or DVD; <sup>x</sup> Partially developed capacity to deliver course using WWW, CD-ROM, and/or DVD; <sup>w</sup> Fully developed capacity to deliver course using WWW, CD-ROM, and/or DVD.

**Table 5. Preferred methods for providing and receiving courses**

Method	Providing		Receiving	
	f	%	f	%
WWW (Internet)	20	74.1	18	69.2
CD-ROM	7	25.9	6	23.1
DVD	3	11.1	3	11.5
Combination <sup>z</sup>	14	51.9	14	51.9

Note: Respondents were asked to check all methods that they preferred. Thus percentages summed across methods do not equal 100.  
<sup>z</sup>combination of WWW, CD-ROM, and/or DVD

Many academic administrators indicated an interest in a combination of delivery formats, (51.9% providing and 51.9% receiving).

Previous research (Miller and Pilcher, 2002) focused on agricultural distance learners indicated that students were more likely to enroll in courses delivered asynchronously. Asynchronous delivery technologies afford students the greatest level of flexibility in managing the different demands for their time. Time is an important factor in students' motivation to pursue distance learning (Hezel and Dirr, 1990). The academic administrators who participated in this study were in step with the broader higher education community in their preference for web based courses. According to a report from the Sloan Consortium (Allen and Seaman, 2004), the expected growth in online enrollment for 2004 was 24.8% which greatly exceeds the growth rate for higher education in general. The report also indicated that there was no reason to believe that online enrollments were leveling off.

**Objective 4:** Describe concerns related to institutional sharing of courses.

Table 6 summarizes academic administrators' concerns related to institutional sharing of courses. A list of eight concerns was developed by the researchers. Administrators were allowed to label each item on the list as "not a concern," "some concern," "moderate concern," and "great concern." A majority of academic administrators expressed great concern about the opportunity for students to interact with the instructor (70.4%), overall quality of course (66.7%), and relevance of course outcomes (55.6%). Slightly less than half of the academic administrators expressed great concern about academic integrity of students completing requirements at a distance (48.1%), instructor's qualifications (44.4%), and opportunity for students to interact with other students (44.4%). A relatively small number of academic administrators expressed great concern about delivery format (22.2%) and intellectual property (14.8%).

Academic administrators were concerned about the interaction of students with the instructor and with each other. Previous research on distance learning in agriculture suggests that this concern is well placed. Roberts et al. (2005) synthesized distance education research in agriculture including many studies focused on interaction. They concluded that

**Table 6. Concerns related to institutional sharing of courses**

Concern	Level of Concern							
	Not		Some		Moderate		Great	
	f	%	f	%	f	%	f	%
Overall quality of course	1	3.7	3	11.1	5	18.5	18	66.7
Relevance of course outcomes	0	0.0	3	11.1	9	33.3	15	55.6
Instructor's qualifications	1	3.7	7	25.9	7	25.9	12	44.4
Intellectual property	2	7.4	8	29.6	13	48.1	4	14.8
Delivery format	1	3.7	8	29.6	12	44.4	6	22.2
Opportunity for students to interact with other students	0	0.0	5	18.5	10	37.0	12	44.4
Opportunity for students to interact with instructor	0	0.0	3	11.1	5	18.5	19	70.4
Academic integrity of students completing requirements at a distance	1	3.7	7	25.9	6	22.2	13	48.1

for asynchronous courses the interaction of students with the instructor and with each other was problematic from the perspective of students and instructors.

Course quality was the second greatest concern of the academic administrators. Much has been written about the quality of distance learning courses. The quality of distance taught courses is often judged by comparing them to on-campus courses. Generally, faculty view distance courses as inferior to on-campus courses while off-campus learners consider them to be equal (Roberts et al., 2005). Reference to an article by Miller and Pilcher (2000) would be helpful to college administrators in understanding the views of students and faculty regarding the issue of quality. Miller and Pilcher ultimately concluded that "if quality off-campus courses in agriculture are to be offered, attention must be given to improving the production, quality control, and distribution systems for courses and materials" (p. 68).

Two other issues were considered to be of great concern by slightly less than half of the administrators. These included academic integrity and instructor qualifications. Monitoring the qualifications of instructors should be a fairly straightforward matter for academic administrators. However, academic integrity may be an issue requiring some additional thought. Administrators are encouraged to consult an article by Rowe (2004) for insights about cheating in online student assessments and suggestions on how to prevent it. In addition, Heberling (2002) offers ideas for addressing plagiarism in online courses.

## Summary

Academic administrators in land grant colleges of agriculture are interested in sharing courses with other universities. Close to 50% of the academic administrators who participated in the study indicated interest in providing or receiving courses at undergraduate and graduate levels. The level of interest expressed by academic administrators in sharing courses varied greatly by subject area. Furthermore, results of the study show that the land grant universities have considerable capacity to offer courses both at undergraduate and graduate levels. Significant opportunities exist for sharing agriculture related courses among land grant universities, particularly at the graduate level.

This study demonstrated that there is interest in and capacity for providing and receiving courses through distance education in colleges of agriculture. However, a framework for sharing courses through distance education must be constructed. It is recommended that the survey results be used to open discussion among academic administrators in colleges of agriculture at National Association of State Universities and Land-Grant Colleges meetings. Besides forming partnerships based on interest and capacity, academic administrators will need to address concerns including the opportunity for students to interact with their instructor, the overall

quality of courses, the relevance of course outcomes, the academic integrity of students completing requirements at a distance, the instructor's qualifications, and the opportunity for students to interact with other students. In addition to these concerns, a host of logistical issues must be addressed.

Individual universities offer similar courses by different titles. It is no surprise to see a high percentage of courses offered in a specific subject area but not delivered via distance education. Surprisingly, a high percentage of land grant universities do not offer courses in key areas. Could this be a result of tightening budgets? Perhaps sharing courses through distance education is a way to meet the need for foundation courses and courses that reflect contemporary agriculture.

To address the recommendations made as a result of this study and to determine the implications for their institutions, administrators need to consider the following questions:

1. What policies impede the sharing of courses with other institutions and how can they be overcome?
2. What areas of excellence at your institution can be developed and distributed for distance education to other institutions?
3. What areas of study at your institution could be strengthened through distance education by partnering with other institutions?
4. What training is needed in your institution that will encourage and facilitate development and sharing of courses at a distance?
5. What technical assistance is needed at your institution that will help faculty develop, deliver, and manage courses offered at a distance?

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