A study of the barriers to education associated

with the latest technology in distance

delivery systems

by

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INTRODUCTION

"To be the premier college of Agriculture with
teaching, research and outreach programs that serve people
in the state, the nation and the world." This is the
opening sentence in Iowa State University's College of
Agriculture mission statement. The final sentence of that
statement reads: "The college is committed to excellence in
outreach programs to increase knowledge and understanding;
disseminate information on new technology; and help in the
decision making in agriculture, rural communities and
society" (College Planning Advisory Committee, 1995). This
statement indicates a strong commitment by the College of
Agriculture to fulfill the directives set down by the Iowa
Board of Regents.

In June of 1990 the Iowa Board of Regents released its
Strategic Plan for Off-campus Credit Programming. This was a
comprehensive assessment of the educational needs of Iowans
who do not live within easy driving distance to a Regent
University and a plan to begin to fill those needs. The
Regent's plan made several judgments. Among those judgments
were, "The accepted general principle is that no qualified
person should be denied access to the Regent universities
because of temporal or spatial barriers." and "In the Plan,
the goals are defined as the essential outcomes to be

achieved and are broadly listed as (1) quality programs, (2) delivered to all citizens of the state, (3) on a cost-effective basis" (Iowa Board of Regents, 1990, p. 3).

Distance Education

Distance education in the United States is generally recognized to have begun in the mid 1850s and was inspired by Reverend W. Sewell of Exeter College, Oxford. Reverend Sewell suggested off-campus study through a system of lectures. American James Stuart, in 1871, proposed a traveling circuit of lecturing professors who later became the University Extension System at the University of Cambridge (Dooley, 1995 p. 31).

In 1873, Anna Eliot Ticknor established a correspondence school for women out of her home in Boston. The "American Society to Exchange Studies at Home," enrolled more than 7,000 women in its university-level correspondence courses over a period of 24 years. With the success of Ticknor's school in Boston, correspondence study caught on in the late 1800s, and was offered by several universities through extension divisions using correspondence study (Dooley, 1995 p. 31).

Even before Reverend Sewell's off-campus lectures a different type of distance education was developing in the United States. The early agriculture societies of

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Massachusetts, Pennsylvania and New York, the State Board of
Agriculture in Ohio, and Columbia and Yale Universities were
giving public lectures along the lines of agriculture, prior
to 1850 (Smith and Wilson, 1930).

In about 1853 farmer's institutes were proposed and
within ten years the Massachusetts State Board of
Agriculture was supporting them. The Kansas State
Agricultural College was the first college of agriculture to
use farmer's institutes in 1868, followed by Iowa
Agricultural College in 1871, and Michigan Agricultural
College in 1876. The farmer's institutes addressed such
things as soils, cattle breeding, the use of manure, milk
production, butter-making and grape growing (Smith and
Wilson, 1930).

The Morrill Act of 1862 created the land-grant college
system. This system was dedicated to the improvement of the
agricultural sciences, mechanical arts, and general
education. It also provided an opportunity for the working
class to gain an education (Hayes-Johnk, 1994).

On May 8, 1914, The Smith-Lever Act was enacted into
law. The Smith-Lever Act was an experiment in government
where the land-grant colleges and the U. S. Department of
Agriculture cooperated with federal, state, county, and
local governments to provide rural education (Smith and
Wilson, 1930).

One of the first things extension personnel had to do was to convince farmers of the relevancy of the organization. County agents had to "sell" Extension to the people. A major strength through the years has been Extension's ability to wear many hats, and to don them rather quickly. The organization has always possessed a flexibility that has allowed it to adjust to changing times (Schwieder, 1993, p. 218). Extension has completed seventy-five years of service to the American people. It has carried the results of research from the land-grant university directly to broad segments of the population. It has taught people how to use this knowledge to improve their lives (Rasmussen, 1989, p. 221). Countless programs in Home Economics Extension and 4-H have been particularly successful (Schwieder, 1993).

The basic ideas that have made extension so successful in the United States have been used, in various forms, by many countries. Sergio Elliot (1990) writing in a publication prepared for the Food and Agriculture Organization of the United Nations makes the following observation. Direct contact with the farmer in an adult education process where he is the principal actor, is a dynamic process, providing myriad opportunities for interaction and intercommunication (Elliot, 1990, p. 2).

Distance education delivery

As demographics in the state and the nation changed, as funding levels and sources changed, the land-grant universities had to change. The largely agrarian nation for which the land-grant universities were created no longer exists and the land-grant universities are slowly changing to meet the public's needs (College Planning Advisory Committee, 1995).

One of these changes was the increasing number of nontraditional students who required courses at night and on weekends, both on-campus and off (College Planning Advisory Committee, 1995). In an attempt to meet the needs of those nontraditional students the land-grant universities experimented with several delivery systems. Although not used until 1972 the term "distance education" now includes all means of delivering educational programs away from the university proper (Dooley, 1995).

One other attempt has been made to reach off-campus students and that is by requiring the instructor to travel to the students' home area.

> The past successes and failures in off-campus
> programming indicate why access to the Regents
> Universities' programs has been inadequate in some
> areas. The universities attempted, at various times in
> the past, to offer programs in some of the under-served
> areas. With few exceptions, these efforts proved
> enormously expensive and were spectacularly
> unsuccessful. These efforts failed for an elementary
> reason; the number of persons who enrolled in the

courses was too small to cover the costs of offering the courses. Given the dramatic imbalance between revenues and costs of offering courses in areas with low enrollments, the situation seemed hopeless. It was clear that what was needed was something that would alter the cost of offering courses in remote sites or the revenue from such courses, or both. That "something" turned out to be instructional television (Iowa Board of Regents, 1990, p. 8).

Many attempts have been made to supply programs for off-campus students with various success rates. These attempts included the use of medium such as radio, television, audio tapes, video tapes, printed materials and satellite down links. The use of printed material, sometimes referred to as correspondence education, is widely used to deliver distance education. Audio and video tapes as well as printed material allows the student to go back and go over any part needed, this is one advantage over the classroom setting (Rowntree, 1992). Many distance educators consider radio and television to be both motivating and effective (Holmberg, 1989). A satellite down-link is a program signal bounced off of a satellite to equipment designed to receive it. That program can be either viewed as it is received or taped for later use. ISU Extension has, at one time or another, used each of these delivery methods. The main drawback of each of these systems is the lack of interaction possible between student and instructor. Education, that is at least more than rote learning and simple training tasks, is a communicative act necessitating

dialogue. The dialogue need not be face-to-face, but it does need to be one mind engaging another. If something more than information transfer is to be accomplished, then mediation and facilitation of some sort must be provided. The term mediation is used to mean intervention by a more informed or skilled person (Farr, 1995, p. 185).

Interactive instructional television is a two-way education delivery system, referred to as compressed video. Compressed video can use existing telephone lines to transmit two-way audio and video. The technique involves the compression of the video image by a CODEC. A CODEC is a computer device that codes and decodes the analog signals produced by cameras and microphones into digital signals that can be sent over telephone lines. The resulting video contains some loss of quality and may look a bit jerky when rapid motion is transmitted (Jurasek, 1993). This technology can be improved if fiber optic cables are used instead of telephone lines. The use of fiber optics improves the clarity and eliminates the jerky motions. Fiber optics are thin transparent fibers of glass that are enclosed by material of a lower index of refraction and that transmit light throughout their length by internal reflections (Kuecken, 1987). The large capacity of these tiny fibers and the speed of light are vital to the interactive delivery system. Also vital to such a system is

the equipment needed to transform light signals to electronic impulses and electric impulses to light signals.

Fiber optic cable is much cheaper than metallic telephone cable and much smaller. The system can be expanded without burying more cable. Expanding the capacity requires adding equipment at the terminals (Kuecken, 1987).

Iowa has installed a network of fiber optic cables to many parts of the state and continues to expand this network. Named the Iowa Communications Network (ICN) this system opens the possibility of offering interactive, multi-site classes to virtually any place in Iowa. The taxpayers of Iowa have spent almost $200 million to connect the network to at least one point in each county. The Iowa legislators have appropriated another $94 million and approved a plan to complete the network by connecting 474 schools and other sites over the next four years (Iowa Fiber-optic Network, 1995).

The Brenton Center

> Faculty will learn how to use new equipment and technology for teaching at ISU's Brenton Center for Agriculture Instruction and Technology Transfer, according to plans that were unveiled earlier this summer.
> Dean of agriculture, David Topel, said staff at the center will help faculty develop new curricula, courses, conferences and seminars to more effectively deliver education in agriculture. The center also will expand the college's teaching capabilities to audiences throughout the state and beyond (Jirik, 1994).

The Brenton Center is a vigorous commitment by Iowa State University and its College of Agriculture to expand off-campus programming aimed at providing access to educational programs in previously under-served areas.

This $1.5 million facility will be developed entirely with private donations. The center is named in memory of W. Harold and Etta Brenton, 1920 graduates of Iowa State College, by family members who donated $250,000 to the project. The center will be located in the renovated north wing ground floor of Curtiss Hall (Jirik, 1994).

Statement of the Problem

The assumption made by the Board of Regents, supporters of the ICN and university administrators is if programs are delivered to local sites, enrollment will significantly increase. Even though goals established for distance education talk about serving the students in remote areas of the state, enrollment will be the driving force determining the continuation or even the initiation of a program. Evaluating a program using enrollment as a measure is quick and easy and vital to the financial success of the university. The reason given for the failure of an off-campus program is, "the number of persons who enrolled in the course was too small to cover the cost of offering it" (Iowa Board of Regents, 1990). If the number of persons who

enrolled is a measure of failure is it not also a measure of success?

If the College of Agriculture at Iowa State University offers quality programs to under-served parts of the state using the ICN, can the administrators of those programs expect an increase in enrollment? If offering programs over the ICN helps to diminish the temporal and spatial barriers, as required by the Board of Regents, can the administrators of those programs expect an increase in participation? If, by offering programs over the ICN, those programs can be offered for a reasonable cost, can administrators expect an increase in enrollment? Or are there barriers created, by using the ICN, that offset the reduction in the impact of existing barriers?

The College of Agriculture administration and the Regents are assuming that if they significantly reduce the travel distance and cost of a class that enrollment will significantly increase. In other words, if they lessen the barriers of time and cost then participation increases. They express very little concern, if any, about barriers that might be created by using the ICN from the student's point of view. There is a concern about the faculty's need to learn to use the technology. Another barrier mentioned was that educational technology and distance education

programs require new pedagogies in which faculty are not trained (Iowa Board of Regents, 1990).

Need for the Study

The learner must be skilled in using the delivery system in order to interact fully with the content, instructor and other learners. It is up to the course designer to include instruction and exercise that will provide opportunities for such empowerment (Hillman, Willis and Gunawardena 1994).

The course designer and the instructor need to know what barriers or apprehensions the learners might have or skills they need so these educational opportunities can be properly designed to focus on those needs. Different groups of learners might, because of their previous experience, have different needs.

The numbers and kinds of barriers to learning by adults are extensive. Almost every publication about adult learning has lists and discussions about barriers. A classification system was developed (Cross, 1981) that included three kinds of barriers: dispositional, situational, and institutional. Dispositional barriers relate to the individual learner and what kind of negative feelings the individual possesses about his or her ability to learn. Examples would be a lack of self-confidence, too

tired, and a lack of interest. Situational barriers include primarily environmental factors that prevent an individual from engaging in the learning process. Examples would be family responsibilities that interfere, work schedules which conflict, and costs. Institutional barriers are erected by the organization providing the educational opportunity. Examples would be inconvenient classes, course provided does not meet the student's needs, and poor quality instruction (Seaman, 1995).

Need for promotion

Programs offered to nontraditional students, whether credit, continuing education, or informational, need to be promoted. Promotions and advertising should not only tell the prospective participant what the class will do for the student, but also should attempt to allay any apprehension the student has about attending this class. To accomplish this the administrator or instructor, who is trying to promote the class, needs to know what apprehensions (barriers) might exist and how intense they are perceived by the participant. Then the administrator or instructor can design a plan to attack the barriers.

Marketing, promotion and advertising are sometimes used synonymously but each has a different meaning. Marketing includes the whole process of trying to ensure optimum

enrollment in a program. Marketing encompasses promotion and advertising but also includes decisions concerning personnel, budget and timing. Examples might be; "Who is going to design the posters?", "How much should be spent on the posters?" and "When should the posters be posted?"

Promotion includes advertising and anything else that would encourage someone to enroll. A program might be promoted by offering a company that enrolls two people at full price the opportunity to enroll the third one at half price. Or a class might be promoted by offering a discount if enrollment is received before a certain date.

Advertising is used to inform prospective students about future programs through printed material, radio, television or orally. Advertisements should include some details about time and place but also should include expected benefits to be gained by attending.

Marketing, promotion and advertising of nontraditional classes offered by ISU has been minimal. The Extension Service does support some of its programs with mailings and posters. And the College of Agriculture's Off-campus Programs office mails a periodic newsletter. These examples appear to be exceptions to the norm. The future does not appear to hold many changes in this low level of promotion. The Iowa Board of Regents' (1990) Strategic Plan for Off-

campus Credit Programming is 42 pages long and does not contain any reference to promotion and advertising.

Purpose

The purpose of this study is to determine the barriers, from the learners point of view, to education associated with the use of the latest technology in distance education delivery systems.

Objectives

To identify the barriers of using new communication technology to deliver distance education.

To describe the extent to which different aspects of distance education technology contribute barriers to education.

To specify what experiences diminish the fears of distance education technology.

To identify the demographics of the participants in the study for comparison purposes.

Operational Definitions

The following terms are defined here to provide clarity of meaning as they are used in this study.

Adoption process a mental process through which an
    individual passes from first hearing about a new idea
    to its final adoption (Jones, 1991).

Advertising Any form of presentation of ideas or services
    by an identified sponsor (McCarthy, 1979).

Barrier Anything a potential learner would perceive as a
    deterrent to their participation in an educational
    activity.

CA Communication apprehension.

Communication apprehension An individual's level of fear or
    anxiety associated with either real or anticipated
    communication with another person or persons
    (McCroskey, 1984).

Computer anxiety The fear and apprehension experienced by
    individual's when considering the implications of
    utilizing computer technology, or when actually using
    the technology (Cambre and Cook, 1985).

CP Computer anxiety.

Distance education Any means of delivering educational
    programs away from the university proper (Dooley, 1995).

Extension Educational activities, generally based on local
    and immediate needs, presented where that need exists.

ICN Iowa Communication Network

Marketing The analysis, planning, implementation, and
    control of carefully formulated programs designed to
    bring about voluntary exchanges of values with the
    target markets to achieve institutional objectives
    (Kotler and Fox, 1995, p. 6).

Nontraditional student Any learner or potential learner who
    fits into at least one of these categories: employed
    full time; over the age of 25; lives outside of easy
    commuting distance to the university; enrolled in a
    non-credit course.

Objection Reason or excuse given for not participating in
    educational activities.

Outreach Educational activities presented to nontraditional
    students.

Potential learner Those who have a desire to learn but who
    are not currently engaged in organized instruction
    (Cross, 1981)

Promotion Inform, persuade, and/or remind target
    populations about the university and the benefits it
    offers (McCarthy, 1979).

LITERATURE REVIEW

The Situation

Iowa State University (ISU) is an institution where
every fourth residential student is a nontraditional
student. ISU is also an institution to which more than
30,000 non-credit (and therefore nontraditional) students
trek every year. ISU recognizes both the importance of
nontraditional learners to the university and the importance
of Iowa State University to nontraditional learners.
Building on that base, the vision for out-state Iowa is for
Iowa State University to be there, in its areas of
expertise, serving the nontraditional learners (Iowa Board
of Regents, 1990).

In November, 1989, ISU hired consultant Carol Aslanian,
of The College Board, to perform a 2-day site visit and make
recommendations on services for nontraditional students at
the institution. What follows is a brief overview focusing
on the major points made during a final presentation to Iowa
State staff at the conclusion of the two-day visit:

1. In general, ISU has adopted the approach of
"mainstreaming" its nontraditional student population--those
persons 25 years of age or older who have returned to
schooling after some absence. That is, the nontraditional
student at ISU, on the whole, adopts the standard

operational procedures of the university and learns in the
ways similar to those of the traditional students (Aslanian,
1989).

Knowles (1984) andragogical learning theory stresses
the need to approach nontraditional learners differently
than traditional pedagogical theory of teaching. According
to the andragogical model:

* A nontraditional learner is
  self-directed.

* Nontraditional learners enter into an
  educational activity with more experiences
  than young adults.

* Nontraditional learners become ready to
  learn when they have a need to know.

* Nontraditional learners are life-centered
  in their orientation.

* Nontraditional learning is facilitated best
  when learners are motivated to learn by
  internal pressures.

2. The external market among the nontraditional
populations is not a particularly strong force in shaping
the institution (Aslanian, 1989).

The College of Agriculture has focused on this problem
by making one of its strategies to actively pursue extended
and continuing education linkages with public and private
agriculture groups and organizations. Such agreements could
provide additional funds to enhance resident instruction,
enhance technology transfer efforts, and help to maintain
instructional programs that are current with industry

practices, problems, issues, and trends (College Planning Advisory Committee, 1995).

3. ISU takes a conservative stance in regard to altering any of its programs (Aslanian, 1989).

Under the heading of Internal Assessment-Education and Instruction a number of strengths and weaknesses were listed by the College of Agriculture in a draft of its Strategic Plan. Among the weaknesses were these two comments: "Minor efforts have been made to accommodate nontraditional students" and "New commuter/educational technology and distance education programs require new pedagogies in which faculty are not trained" (College Planning Advisory Committee, 1995).

ISU Extension would be one exception to this observation. There exists a strong and willing capability to respond to emergencies as in the drought of 1988 and floods of 1993. Campus staff have explored new models for extension programs. The Pork Industries Center is one example, drawing from extension and non-extension faculty and staff, commodity organizations, and community colleges (College Planning Advisory Committee, 1995).

4. ISU has taken some minimal steps in responding to the nontraditional population, but not in truly pervasive, significant ways (Aslanian, 1989).

Programs designed for nontraditional students need to be promoted. In the first section of their instructional guide, Hunter and Beeson, (1992) explain why open learning needs marketing and what steps go into preparing a marketing campaign.

5. Too often the faculty and staff of ISU refer to the problems and criticisms the institution would receive if it did expand its off-campus programs (Aslanian, 1989).

6. It appears that nontraditional students enroll at ISU "in spite of the institution." They are not to any appreciable degree recruited or sought (Aslanian, 1989).

In a draft of the Strategic Plan dated January 6, 1995, the College of Agriculture addresses several issues. Issue # 7 is "The College does not have adequate programs addressing the educational needs of the nontraditional and/or place bound student". One strategy offered was to conduct an aggressive marketing campaign for off-campus programs. This campaign should specify educational outcomes and specifically the benefits of programs, focusing on skills and knowledge that lead to job enhancement and career development (College Planning Advisory Committee, 1995, p. 21).

7. Given the fact that enrollment services staff spend nearly all their time recruiting at the high school level and given the fact that many institutions are accelerating

their marketing efforts, the goal of maintaining enrollment numbers through high school and transfer students seems unrealistic (Aslanian, 1989).

In a draft of the Strategic Plan dated January 6, 1995, the College of Agriculture's issue # 10 was "The pool of students who traditionally have enrolled in the College is shrinking". Three strategies were offered. None of them suggested compensating for a decrease in traditional students with an increase of nontraditional students (College Planning Advisory Committee, 1995, p. 23).

8. Support services offered by ISU to adult students are working well (Aslanian, 1989).

9. To get the faculty to embrace nontraditional education, incentives tied to tenure and promotion need to be offered by the administration (Aslanian, 1989).

Faculty contributions in off-campus teaching should be considered in performance appraisal to the same degree as on-campus teaching (Iowa Board of Regents, 1990, p. 22).

10. Child care opportunities at ISU are not adequate (Aslanian, 1989).

11. ISU's 102 extension sites can serve as a major resource if and when the university decides to realize its land-grant mission (Aslanian, 1989).

12. Some of the changes that are beneficial to nontraditional students could be equally good for high

school students who also want to study in more
nontraditional ways (Aslanian, 1989).

13. For more to happen at ISU in regard to
nontraditional students, the faculty and staff need to have
visible and direct endorsement from the top (Aslanian,
1989).

The College of Agriculture at Iowa State University is
constructing a center for interactive instructional
delivery. This center is an effort to enhance on-campus
instruction as well as meet the needs of the nontraditional
student. It should also help ISU comply with the Regent's
directive for readily accessible classes and address some of
Aslanian's points. Dr. David Doerfert, Off-Campus Program
Coordinator, in a letter to Off-Campus Agriculture Students
explains it this way; "The planned June 1, 1995, opening of
the College's Brenton Center for Agricultural Instruction
and Technology Transfer (a multimedia teaching and learning
center) will greatly enhance the College's ability to
provide high quality educational experiences beyond the
boundaries of the Ames campus." An article from _Inside
Iowa State_ under the headline "Plans unveiled for Brenton
Center" contained this statement: A video conference area
and two multimedia presentation classrooms will allow
teachers to use the Iowa Communications Network to teach
students many miles from the campus (Jirik, 1994, p. 2).

Distance education classes have been offered using workbooks, videotapes, audio tapes and interactive video as various delivery methods. To make these delivery methods complete some type of support must be supplemented. Learners need help and support from other people. Learners without support are liable to delay their completion of a program or to drop out altogether (Rowntree, 1992). An interactive delivery system would allow for support at every class meeting. This support is needed because learners are individuals, they are different. They have different needs, goals, experiences and aspirations.

There is no evidence that distance students should be regarded as a homogeneous group. The reasons nontraditional students choose distance education are primarily the convenience, flexibility, and adaptability of this mode of education (Holmberg, 1989).

Distance education students are identified by one of four orientations (Rowntree, 1992):

1. vocational – to do with the learner's present or hoped-for job.

2. academic – to do with interest in study or education for its own sake.

3. personal – to do with developing oneself as a person.

4. social – to do with partying, playing sports and having a good time.

And all but the last of these can be pursued either for intrinsic or extrinsic purposes. A person may be

(intrinsically) interested in what they are learning. Or they may be (extrinsically) interested in what they hope will result from the learning such as: a promotion, a pay raise, a degree, the respect of a spouse. The fourth orientation seems purely extrinsic, showing no interest in studying at all, other than an excuse for being in congenial company (Rowntree, 1992, p. 44-45). Intrinsic refers to the essential nature, or that which is from within, an organization or organism. Extrinsic is external, from the outside.

Returning nontraditional students

Eighty-four percent of nontraditional students said they returned to school for a career related reason. The remaining 16% said they returned for intellectual growth or simply because it was convenient (Spanard, 1990).

As Iowa continues to expand it's fiber optic network and ISU's College of Agriculture strives to complete the Brenton Center, the assumption exists that people involved in agriculture, wherever they may reside, want more education. This assumption is validated by the following research summary.

"Cognitive interest" (reflects the view of learning as a way of life and the belief in the concept of learning for the sake of learning) was found to be the highest motivating

factor among production agriculturalists. Persons in business also had a mean factor rating higher than that of government service agency persónnel. The researcher believed that this finding was due to the drive for production agriculturalists and business people to increase their competitiveness and performance in a dynamic environment of technology and information (Miller, 1991, p. 42).

Indeed, if it is true that nearly all adults need and want to learn, then a comprehension of deterrent is obviously crucial to understanding and predicting their involvement in education (Scanlan and Darkenwald, 1984). Deterrent as used here is synonymous with barriers.

Barriers

Much of the distance education literature has addressed the increase in the number of nontraditional students on college campuses and how colleges could or should adapt to the needs of the nontraditional student. "As the campus population changes, new student activities programs and redesigned existing programs need to be created. Colleges and universities must rethink the programs offered for minority students and nontraditional students, those 25 years of age and older" (Rasch, 1988).

Several articles echoed the same conclusion, that
colleges and universities must change to meet the needs of
an increasing number of nontraditional students (Ahgren-
Lange, Ulla^Kogan and Maurice, 1992; Kerka, 1992; Lightner,
1984). Each of these authors in their own way stressed the
importance of trying to fill the needs of nontraditional
students. They each listed barriers that hinder the
nontraditional student and suggested programs and procedures
that they think will enable those students to overcome them.

> Needs of the nontraditional/adult learner concern the
> following areas: service and support, personal/social
> development, academic preparation, academic
> administrative, and academic instructional. Service
> that should be available at convenient hours and
> locations include registration, library, book store,
> and counseling. Personal/social development needs
> include the need to manage time and set goals, the need
> for communications skills improvement, and the need for
> peer support. Remedial work and study skill
> improvement are specific academic preparation needs,
> while the need for evening classes, simplified
> registration, and flexible curriculum scheduling are
> academic administration needs for the adult student.
> Finally, academic instructional needs include the need
> for individualized instruction as well as practical
> learning experience (Lightner, 1984).

A number of studies have been compiled trying to
determine the barriers to education involving nontraditional
students. When the results of these surveys are tabulated
the barriers of time and cost are at or near the top of the
list.

A great many descriptive surveys have queried adults about reasons for non-participation, or barriers to participation, and produced long lists of items. Like most of the smaller-scale studies, the two major national surveys of participation found the following to be especially significant barriers: cost, lack of time, inconvenient scheduling, lack of information about educational opportunities, job responsibilities, home responsibilities, lack of interest, and lack of confidence. In general, the barriers adults report as most severe are lack of time and cost (Scanlan and Darkenwald, 1984).

Byrd's (1990) research indicated that time (or lack thereof) is the top ranking barrier to nontraditional students. Included in "time" is class time, travel time, study time and the time the class is scheduled. The second highest ranking barrier is cost.

<div align="center">Time</div>

After interviewing one thousand nontraditional students Aslanian and Brickell (1988) made the following observation: (1) adults spend very little time traveling to class; (2) half of them can get there in less than 20 minutes; (3) most of the rest can get there in less than 45 minutes; (4) One hour is the extreme upper limit. From this observation they drew these interpretations: No wonder more than 70 percent

give convenient location as a prime reason for selecting a college. Adults draw a tight circle of travel time around themselves and then look for a college inside the circle: outside the circle, outside consideration. The image of the busy adult emerges once again from these data. Rationing too little time among too many demands, adults will devote little time for class, less time for study, and no time to waste simply getting to class.

Lack of time is a barrier. Lack of time is also a component of several other barriers. A needs assessment document entitled Iowa State University Adult Graduate Student Survey (Thomson, 1994) listed twenty-five barriers and requested a ranking. Of those twenty-five barriers, over one-half contain some element of time as a deterrent. The barriers from that survey are listed below:

1. Cost of education

2. Admissions requirements

3. Lack of time to balance home, school, and job responsibilities

4. Time to complete academic program

5. Attendance requirements

6. Class scheduling

7. Child care

8. Stress

9. Family doesn't approve

10. Feel too old to compete academically

11. Tired of studying

12. Lack of self-confidence in ability to succeed

13. Research and teaching responsibilities

14. Parking requirements

15. Lack of study skills

16. Finding uninterrupted time to study

17. Bureaucratic rules, regulations and procedures

18. Classroom procedures and practices

19. Courses not applicable

20. Courses not available

21. Feeling isolated from other students

22. Classroom teaching techniques

23. Advisor availability

24. Availability of career counseling

25. Adequate orientation to university

Only three of these items specifically mention time. Yet, "attendance requirements", "class scheduling", "stress" and "tired of studying" are all items that would be less of a problem with more time. "Research and teaching responsibilities" (job requirements) is another competitor for time. If a student could attend at a different time "child care", "bureaucratic rules, regulation and procedures", "courses not available", "advisor availability"

and "availability of career counseling" might not be as much of a problem.

Cost

Cost as a barrier involves dollars, either those that must be spent or those that would otherwise have been earned. There are the obvious costs of tuition, books, supplies and transportation. And the not so obvious costs of child care, vacation time used and overtime lost.

Financial cost was the most widely reported potential obstacle, cited by slightly more than half of all would-be learners. Cost is a deterrent particularly for adults under thirty-five. Nearly three-fourths of the young women and more than half of the young men indicated some kind of financial burden regarding tuition, books, materials, transportation or child care (Carp, Peterson and Roelfs, 1974).

In their study of reasons for not attending adult education classes, Johnstone and Rivera (1965) found 48 percent said they couldn't afford it. They then identified what they called persons with high participation readiness. The people in that group said they couldn't afford it 43 percent of the time.

Byrd (1980) examined the barriers to education perceived by students 25 years old and older. Cost was the

third most frequently reported barrier behind "not enough time" and "amount of time required to complete the program".

Communication Apprehension

Communication apprehension (CA) is defined as "an individual's level of fear or anxiety associated with either real or anticipated communication with another person or persons" (McCroskey, 1984, p. 13). A large volume of research has been done on CA and the barriers it creates. Because communication is a part of interactive delivery systems for education, CA is a possible barrier.

Surveys have recorded that Americans fear speaking before a group more than they fear heights, disease, financial problems or death. Approximately 85 percent of the population feel anxious speaking in public (Motley, 1988).

The cause or reason for a predisposition to CA is not fully understood or researched. The best methods of isolating causes of subsequent events generally is considered to be carefully controlled experimentation. Unfortunately, for ethical reasons, this method is highly restricted for investigations of the causes of CA (McCroskey, 1984).

However, five explanations for the development of anxiety have been offered (Horwitz and Young, 1991). One

explanation involves genetic predisposition. Research on identical and fraternal twins, twins raised apart, and adopted children indicates genetics may be a substantial contributor of CA. Another explanation relates to a person's history of reinforcements and punishments when attempting to communicate. A consistent history of punishments for communication attempts may easily create an apprehensive individual. The next explanation is closely related to the previous one. Random and inconsistent patterns of rewards, punishments, and nonresponses to attempts to communicate can lead someone to develop a high level of CA. Another explanation for the development of CA focuses on the adequacy of people's early communication skills acquisition. Children who do not gain good communication skills early are more likely to be apprehensive. The final predominant explanation emphasizes the role of appropriate models of communicators. This view presumes that individuals gain some of their communication skills by observing others. In all likelihood no single explanation accounts for CA, but a combination of two or more (Horwitz and Young, 1991).

Novelty in CA

Novelty, is an aspect of CA that explains the fear of speaking before an audience. What has the speaker to fear?

One answer is the unknown. There are three aspects of novelty (Daly and Buss, 1984). First, there is the novelty of environment. The less familiar the setting for the speech (a different room, a different city, a different building, ect.) the greater the CA. Second, there is the novelty of audiences. The less familiar the audience, the greater the speaker's anxiety. Third, there is the novelty of role. A novel role generates anxiety. Novice speakers are unaccustomed to being the focus of an audience's attention (Daly and Buss, 1984).

Someone considering enrollment in a class offered over an interactive distance delivery system could regard themselves in a novel situation in one, two or all three aspects discussed above. Certainly most students would be unaccustomed to an environment with cameras, microphones and video screens. If audience is defined as a group of listeners, then unless the student is familiar with the other students and the instructor, who are listening, then the CA level could be high. For some the role of student is unfamiliar.

All three kinds of novelty share two sources of CA: fear of the unknown and uncertainty about how to act. Taken alone each may contribute to the amount of CA an individual experiences. Together, they can cause panic and disorganization. The magnitude of their impact is affected

by an individual's personal characteristics (Daly and Buss, 1984).

When people are confronted with a circumstance that they anticipate will make them uncomfortable, and they have a choice of whether of not to confront it, they may decide either to confront it and make the best of it or avoid it and thus avoid the discomfort. Some refer to this as a choice between "fight" and "flight." Research in the area of CA indicates that the latter choice should be expected in most instances (McCroskey, 1984, p. 35).

In their study Stacks and Stone (1984) concluded that simply completing a basic speech communication course reduces the high CA students fear or anxiety toward communication. Horner's (1989) research resulted in a much different conclusion. This study did not find a significant reduction in CA when students participated in a basic speech communication course which included teaching not only the skills of interpersonal communication but public speaking skills as well.

Perception of leadership and CA

A correlation exists between perception of leadership and CA. That is the higher the CA the lower the perceptions of leadership, either by self-evaluation or evaluation of others in the group. Hawkins and Stewart, (1989) reported

that higher apprehensives were rated significantly lower in
emerged leadership than lower apprehensives. And higher
apprehensives rated themselves lower in emerged leadership
than did lower apprehensives.

Computer Anxiety

While the computer is commonly viewed as a tool for
simplifying and enriching lives, many individuals react to
this technology with feelings of anxiety, paranoia and
alienation. Fear of computers reflects a generalized fear
of current technology (Baumgarte, 1984).

Computer anxiety is the fear and apprehension
experienced by an individual when considering the
implications of utilizing computer technology, or when
actually using the technology (Cambre and Cook, 1985).
Computer anxiety is a resistance to talking about computers
or even thinking about computers, fear or anxiety toward
computers, and hostile or aggressive thoughts about
computers (Weil, Rosen and Wugalter, (1990).

Under the headline "Techno terror slows info highway
traffic" Wiseman and Enrico (1994) report in USA Today about
what they call cyberphobia. Cyberphobia is people's fear of
technology. These results are from a Gallup survey. They
report that 32 percent of the 605 white-collar workers
surveyed confess to being cyberphobic. Fifty-eight percent

haven't heard about the Internet. The Internet is a web of computer networks that lets users tap databases and send e-mail around the globe. E-mail is using a computer and modem to transmit messages or data to another computer, electronically. A modem is a device that lets a computer use the telephone lines.

Lack of knowledge of computer jargon and terminology is one source of anxiety. The last three sentences in the previous paragraph were necessary because the computer technology terms used may not be understood by everyone. People may resist using computers because they do not understand even the most elementary terminology (Howard, 1986).

Profile of the computer anxious

This phenomenon of computer anxiety has also been called technostress, technophobia, cyberphobia, computer aversion and computerphobia. One conclusion from a study by Rosen, Sears and Weil (1993, p. 28) was that, regardless of how you label the phenomenon, there is a large group of people who experience mild to sever discomfort with computers and other forms of computerized technology. Research with college students, business people, and the general public has estimated that approximately one fourth

to one third of all people can be classified as
technophobic.

The technological revolution of the last 25 years has
not occurred without taking a toll on the American psyche
(Rosen, sears and Weil, (1992). As early as 1963, Robert
Lee, a social psychologist at IBM, examined a large
nationwide sample of "popular beliefs and attitudes about
one of the prime symbols of our rapidly changing technology,
the electric computer" (Rosen, Sears and Weil, 1992,)

When computers are introduced into the classroom, some
students respond enthusiastically and quickly master the
skills necessary for the effective utilization of the
machine. For some students however, the experience is
unpleasant (Okebukola, Sumampouw and Jegede, 1991-92, p.
222). The proliferation of computers on the university
campus is viewed as a positive sign that the American
educational system is keeping up with the emerging
technological revolution. Unfortunately, there is a segment
of this population that will not make use of the computers
in any shape or form (Rosen and Weil, 1990, p. 276).

Several fears contribute to computer anxiety. Related
to intimidation by computer jargon, mentioned earlier, is
the fear that one is so far behind in learning about
computers that it is hopeless to try to catch up. When
computers are brought into the workplace there is a fear,

expressed by some, of being replaced by one. Another

contributor to computer anxiety, that arises from the lack

of knowledge, is the fear of pushing the wrong button and

damaging the machine or erasing the memory. The fear of

failure and the fear of the unknown, although not specific

to computer anxiety, may contribute to it (Howard, 1986).

The majority of research over the past two decades has

attempted to construct a profile of the computer anxious

person. This profile has centered around several factors;

gender, age, ethnic background, mathematics anxiety, and

computer experience. These efforts have been mostly

inconclusive and contradictory (Rosen and Weil, 1990).

It has been proposed that age correlates to computer

anxiety because of the belief that computer literacy is

inversely related to age. Also, younger people are

generally regarded to be more flexible in their attitudes

(Howard, 1986). There is no evidence to support the

popular myth that older people are more computer anxious

than younger people. No consistent relationships were

found between age and any measure of computer anxiety for

college students, business managers, clerical employees,

hospital employees or computer operators (Weil, Rosen and

Wugalter, 1990, p. 363). Rosen and Weil (1990) report that

their work, with thousands of college students, and the

research of others shows no consistent relationship between

age and computer anxiety. Gilroy and Desai (1986) report in the results of their study on computer anxiety that an analysis of variance indicated that age did not attribute significant variance. Older adults were less computer anxious and had less computer experience than younger adults (Dyck and Smither, 1992).

Research relating gender and computer anxiety is no more conclusive than the research relating age and computer anxiety. Rosen and Weil (1990), after a review of the literature, report that the results from dozens of studies are contradictory with some showing women as more computerphobic and some showing no gender differences.

Women are only slightly more computer anxious than men, although these differences were neither strong nor consistent (Weil, Rosen and Wugalter, 1990). Young males liked computers more than young females, however, no differences between older males and older females were found on the computer-liking subscale (Dyck and Smither, 1992).

Gender differences in computer use emerge for programming and game playing but not for other computer applications (Gilroy and Desai, 1986). High school women slightly outnumber men in data-processing courses that stress applications such as word-processing and spread sheets rather than programming (Gilroy and Desai, 1986). Female students show less computer interest while showing

equivalent computer literacy and aptitude (Rosen and Weil, 1990).

Rosen and Weil (1990) report that data on ethnic variations in computer anxiety are also unclear. Some studies have shown that white students have more computer anxiety than non-white students (Rosen, Sears and Weil, 1987) while others have shown that white students are less computer anxious than black students (Gilroy and Desai, 1986). Other work (Rosen, Sears and Weil, 1989) has shown no ethnic differences across all computer anxiety measures.

Mathematics is an integral part of computing and the literature shows that women have less experience with mathematics than men (Rosen and Weil, 1990). So some have postulated that women would be more computer anxious than men because of their mathematics anxiety.

Computer anxiety is related to math phobia and other anxieties, but these relationships rarely account for more than 10% of the variance in predicting computer anxiety (Rosen and Maguire, 1990). Computer anxiety is not simply an extension or manifestation of math anxiety (Rosen, Sears and Weil, 1993).

Although there are interesting parallels to math anxiety and test anxiety; math anxiety, test anxiety, and computer anxiety are not the same thing. Computer anxious people tend to be more math and test anxious, but there is

only a small overlap between math anxiety, test anxiety, and computer anxiety. Thus, computer anxiety is more than a modern, technological version of math or test anxieties (Weil, Rosen and Wugalter, 1990, p. 364).

Shannon (1992, p. 329) summarizes the results of three studies analyzing the relationship between computer anxiety and the level of computer experience. As students gain more experience with computers, their attitudes generally become more positive. Students with more than one year of prior computer experience have been reported to have more confidence in their computer ability, like computers more, find computers more useful, and be less anxious about working with computers than students with less computer experience

In a pretest-posttest study on psychology, computer science and business students who used a computer for 10 weeks did not become less computer anxious (Rosen, Weil and Sears, 1987). The computer anxious person feels discomfort and impaired ability when compelled to use a computer, and avoids all computers and computer-related technology whenever possible (Rosen and Weil, 1990). It is possible that the computer anxious person has less experience with computers because he/she is computer anxious and not computer anxious because of the lack of experience.

Computer experience does not cure computer anxiety (Weil, Rosen and Wugalter, 1990).

The most popular approach to reduce computer illiteracy is to offer instruction in computer programming. Such programming know-how does not increase user-friendliness. A course in computer usage and computer applications to actual work situations would more effectively reduce computer fears than would immediate instruction in programming (Gilroy and Desai, 1986).

Rosen and Weil (1990, p. 277) summarize their demographic profile. The computer anxious person can be young or old, male or female, white, black or Hispanic who is not anxious in general, but is probably somewhat anxious about mathematics. This student may actively avoid computers or when faced with computer interaction, become more computer anxious.

Marketing

Kotler and Fox (1995) discuss six steps in what they call the student-recruitment process. Part of one step is to conduct research to understand the student decision process. In the discussion of this step they emphasize the need to find out, "What are the characteristics of the applicants who are accepted and do not enroll?" In other words, "What are the barriers?" Another step emphasizes the

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need to plan and implement action programs to increase
enrollment.

Marketing is a central activity of a modern educational
institution, growing out of its desire to effectively serve
some area of human need. To survive and succeed, an
institution must know its markets; attract sufficient
resources; convert these resources into appropriate
programs, services and ideas; and effectively distribute
them to various markets and publics (Kotler and Fox, 1995,
p.6).

The concept of exchange is central to marketing.
Through exchanges individuals or small groups or
institutions or whole nations attain the inputs they need.
By offering something attractive, they acquire what they
need in return. A professional marketer is skilled at
understanding, planning and managing exchanges. The manager
knows how to research and understand the needs of the other
party; to design a valued offering to meet these needs; to
communicate the offer effectively; and to present it at the
right time and place (Kotler and Fox, 1995, p. 6).

The process of making a decision is nearly the same
whenever it concerns something new. Whether that "something
new" is the latest computer gadget or an opportunity to
enroll in an educational activity the decision process is
very similar. Marketing professionals need to know and

understand this process called the adoption process. The

adoption process is a mental process through which an

individual passes from first hearing about a new idea to its

final adoption (Jones, 1991).

The adoption process identifies several stages that an

individual moves through when making a decision about

something new. McCarthy (1979) lists the following:

1. Awareness The potential customer comes to know about the
product but lacks details.

2. Interest If the customer becomes interested, he/she
gathers general information and facts about the product.

3. Evaluation The customer begins to make a mental trial,
applying the product to his/her own situation.

4. Trial The customer may buy the product so that he/she
can try it. A product that is too expensive to try or can't
be obtained for trial may have trouble being adopted.

5. Decision The customer decides on either adoption or
rejection. A satisfactory experience may lead to adoption
of the product and regular use.

6. Confirmation The adopter continues to think over the
decision and searches for support for the choice made
(McCarthy, 1979, p. 123).

One aspect of marketing is promotion. Promotion is

communicating information between seller and buyer to change

attitudes and behavior. The adoption process fits very

neatly with another action-oriented model called AIDA. The

AIDA model consists of four promotion jobs which have guided

promotion specialists for years: (1) to get attention, (2)

to hold interest, (3) to arouse desire, and (4) to obtain

action (McCarthy, 1979).

Marketing is the applied science most concerned with managing exchanges effectively and efficiently, and it is relevant to educational institutions as well as to profit-making firms (Kotler and Fox, 1995, P.26).

Summary

Change is difficult. Iowa State University is struggling with the need to change its approach to nontraditional students. The Agriculture College at ISU is attempting to lead the way with its off-campus programs and the imminent opening of the Brenton Center for Agricultural Instruction and Technology Transfer.

Many barriers confront the nontraditional student. These barriers are either dispositional, situational or institutional. The two barriers that most often head the lists are time and cost. Distance education, especially programs delivered via the ICN, should reduce the effects of time and cost.

Technology used to deliver interactive educational programs might also contribute barriers. Because this interactive technology requires communication, two possible barriers would be technology anxiety (computer anxiety) and communication apprehension (CA). Much of the literature concerning computer anxiety and communication apprehension is conflicting.

Not only is the research conflicting, it is also beginning to show its age. There is a need for more research on barriers and electronic technologies. The program developer, the program instructor and the program promoter need to know what barriers they are facing.

METHODOLOGY

This study was a descriptive study. The major purpose of descriptive research in education is to tell "what is" (Borg, 1963). The objectives of this research could be rewritten as a "what is" type of question. What barriers exist? What aspects of technology contribute to barriers? What experiences diminish the barriers? What are the demographics of the participants? These questions are descriptive in nature. This study was also what Borg and Gall (1983) call confirmatory in nature. Hypotheses were tested based on prior research and personal observation.

The methods and procedures described in this chapter refer to the development and implementation of a questionnaire entitled: Distance Education in Agriculture: Understanding Your Educational and Informational Needs. This study uses a part of that questionnaire. The population and sample sections are descriptive of this study.

Population

The population for this study (which was part of a larger study) was the membership of the Iowa Soybean Association. This population met the characteristics established by the researcher for this study. Those

characteristics were Iowans involved in agriculture, primarily production agriculture. Most of the members of the Iowa Soybean Association raise soybeans and corn and many raise livestock. Of all the membership lists that were available for this study The Iowa Soybean Association best represented the Iowa farmer.

Sample Selection

The Iowa Soybean Association provided a membership list with 7,000 names. Krejcie and Morgan's (1970) Table for Determining Sample Size from a Given Population recommended a sample of 364 names. A random sample was drawn. This sampling procedure has a 5 percent margin of error.

Methods and Procedures

The methods and procedures of this study can be organized under four main headings: focus groups, the instrument, data collection, and data analysis. Focus groups were used to develop questions for the instrument. The rest of the study depended upon and builds from the information gained by using the instrument.

Focus Groups

A focus group by definition has five characteristics: (a) people, who (b) possess certain characteristics, (c)

provide data (d) of qualitative nature (e) in a focused
discussion (Krueger, 1988). To meet this definition of
focus groups an on-campus planning committee was called by
the Project Director, Dr. David L. Doerfert. This committee
identified 13 groups from which to sample and solicit
information.

Focus groups identified:

1. Young Livestock Farmers

2. Older Row Crop Farmers

3. Part-time Farmers

4. Females in Agriculture

5. Older Livestock Farmers

6. Young Row Crop Farmers

7. Agribusiness-Service/Sales

8. Agribusiness-Personnel/Trainers

9. Agriculture Media

10. Agriculture Teachers/Extension

11. Ecology/Environmental

12. Black Community

13. Urban Agriculturist

The purpose of the focus groups was to use their
responses to develop 4 instruments for a College of
Agriculture Distance Education Market Analysis. The
different instruments were to be developed for: producers,
agribusiness, educators, and urban/minority.

Extension personnel and other community leaders were called upon to identify people that fit the characteristics for a particular focus group. An attempt was made to have several regions of the state of Iowa represented. The focus groups met at Mason City, Atlantic, and Des Moines. A copy of the correspondence with the participants of the focus groups can be found in Appendix I.

Eleven of the 13 planned focus groups were conducted. The agriculture teachers/extension group was to be conducted using the ICN but was canceled due to technical problems. The black community group was canceled due to inclement weather, but people scheduled to participate were subsequently interviewed by telephone.

There were 66 people who participated in the 11 focus groups. The range of participation was a high of 10 at one group to 2 at another. The questioning sequence guide used by the moderator at the focus group meetings can be found in Appendix A. Each of the participants of the focus group were given an Iowa State coffee mug and notebook folder. These appreciation gifts were presented at the end of the focus group meeting. The participants were not told that they would be receiving gifts in advance of the meeting.

The Instrument

The tape recordings of the focus group sessions were transcribed. The instruments were drafted from an analysis of those transcripts and from a review of the literature. Because of the similarity of responses one instrument was developed for both agriculture producers and agribusiness. A slightly different instrument was drafted for educators and another instrument for urban/minority.

A disclaimer usually accompanies focus group research cautioning against the generalization of focus group research beyond the subject population. Research findings by Gillespie (1992) show that 82 percent of the information derived from focus group research can be inferred to the target population with a measured confidence level. Although this level of external validity may be considered low for some research it would appear to be adequate for drafting survey questions. This assumption is based on the following statement from Gillespie's (1992) research. " The predominance of agreement between the focus group findings and the survey research in this study does suggest that the extensive use of focus group research in program planning, product design, and in other decision-making as an inferential technique has some justification" (p. 71).

A review of the instrument was performed by several experts in the field of Agriculture Education for content

and face validity. The instrument was field tested by the participants of the focus groups. A copy of the cover letter mailed with the instrument for field testing can be found in Appendix B.

Suggestions and comments made by both the expert review and the field test participants were used to improve and fine tune the instrument. Specifically, several statements were not clear and the instrument was judged to be too long. It took too much time to complete. The ambiguous statements were reworded for clarity. Some sections were considered to be redundant or only for investigating fine points and were eliminated. A copy of the final instrument for agriculture can be found in Appendix G.

Section III of the questionnaire is "Educational Technology Use". The introduction to this section reads: "New electronic technologies have increased the possibilities by which a university can share its educational and informational resources. This section of the questionnaire seeks to understand your personal preferences toward using these new technologies and potential barriers that could prevent your participation."

Part A of this section included a statement designed to explain interactive delivery systems and define the environment from which the subject should respond. That statement was: There is a class offered by the university

that you have always wished to take but it was too far to drive. Through new electronic technologies the class is being offered at several sites around your state, one of which is your local high school. This new technology is an interactive delivery system that allows you to see and hear the instructor (who is at the university) and for the instructor to see and hear you. Other students at other sites will also be able to see and hear you.

The directions for Part A, Section III were: Please indicate if any of the items below would present a problem or inconvenience for you in attending the class described above. Using the 4-point scale provided below, indicate your personal difficulty with each item by circling the appropriate number.

The 4-point scale used was:

1 Not A Problem

2 Problem But Not Difficult

3 Moderately Difficult Problem

4 Very Difficult Problem

Eight items were listed:

* Lack of time for class

* Still too far to drive

* Being watched by a video camera

* Communicating by microphone

* Costs too much

      * The interactive technology itself

      * Nobody else in the classroom

      * Instructor is miles away

Lack of time for class and costs too much were used because they appear at or near the top of most studies that rank barriers to education for nontraditional students.

One of the advantages of using electric technology to deliver educational programs to remote site is to reduce the distance a student needs to travel. Is one's local high school still too far to drive for a class?

The responses to these statements were reported in frequency tables. A one-way analysis of variance (ANOVA) was performed using SPSS.

Communication apprehension can be a barrier to education. Probably nothing can increase CA more than being conspicuous in one's environment (McCroskey, 1984, p. 25). There are two aspects of an interactive delivery system that could make one feel conspicuous in one's environment; being watched by video camera and communicating by microphone. Another contributing factor to CA is novelty (McCroskey, 1984). Video cameras and microphones present a novel situation to many people.

Computers and computer type technology have caused anxiety in some people. Is there a barrier to education created by the interactive technology itself?

Interactive delivery systems allow classes to be presented at remote sites. Some students may be apprehensive when the instructor is miles away. It is also possible that a student may find <u>nobody else in the classroom with me</u>.

In Section III Part C the subject was asked to respond to nine statements. The subject was directed to, "Please indicate your feelings toward each statement by circling the number that correctly corresponds." The choices were:

1   Strongly Disagree

2   Disagree

3   Slightly Disagree

4   Slightly Agree

5   Agree

6   Strongly Agree

The first four statements were designed to measure communication apprehension (CA). Those statements were selected from an instrument titled "Personal report of communication apprehension-organization form (Scott, McCroskey and Sheahan, 1978, p. 4). A CA score was derived using this formula: Score = 14 - (total of statements 1 and 4) + (total of statements 2 and 3). The higher the score the higher the CA. The score should be between 4 and 24 inclusive. The CA scores were then recoded using SPSS so that a score of 10 or lower becomes a 1, a score of 11

through 17 becomes a 2 and a score of 12 or higher becomes a
3. The scores were then referred to as high, medium and low
according to this grouping. The four statements used to
measure CA were:

* I am basically an outgoing person.

* I am afraid to express myself in a group.

* I talk less because I am shy.

* I enjoy responding to questions at a
  meeting.

Statements five through nine of this section were used
to further describe the barrier of time. These statements
were selected from a list of variables called Family
Constraints by Scanlan and Darkenwald (1984, p. 161). The
wording of these statements was modified to fit the context
of this questionnaire, but the basic concept was retained.

* Attendance at educational programs
  generally infringes upon my family time.

* I tend to feel guilty when away from home
  or family for an educational activity.

* My family/spouse object to my outside
  activities.

* With all my other commitments, I just don't
  have the time to attend educational
  activities.

* It is often difficult to arrange for child
  care so I can attend an educational
  activity.

Section III Part D was focused on the subjects'
attitudes toward computers and computer-based technologies.

Seventeen statements were provided. The introduction and directions for Part D were: To understand your attitude toward using computer-based educational technologies, listed below are several statements regarding your use of computers. Please indicate your feelings toward each statement by circling the number that correctly corresponds. The numbers represented the same response choices as in Part C.

Six statements in Part D were selected from subscales of the Computer Attitude Scale (Woodrow, 1992, p. 183-184). Those six statements were used to measure computer anxiety. They were randomly assigned among the other statements in this part of Section III. The six statements and their numbers were:

2. Working on a computer makes me nervous.

4. Computers do not scare me at all.

6. I want to learn more about using computers.

7. I would have a computer now, but they are too difficult to operate.

9. I feel aggressive and hostile towards computers.

13. I feel confident in operating a computer.

A computer anxiety score (CP, for computerphobia, was used as a variable name because CA was used for communication apprehension) would be derived using this formula: Score = 21 - (total of statements 4, 6 and 13) +

(total of statements 2, 7 and 9). The higher the score the higher the computer anxiety. The score should be between 6 and 36 inclusive. The CP scores were then recoded using SPSS so that a score of 15 or lower became a 1, a score of 16 through 26 became a 2 and a score of 27 or higher became a 3. Scores were then referred to as high, medium and low according to this grouping.

Nine statements from this part of Section III were descriptive and were used to specify computer experience. They also describe reasons for not using a computer other than anxiety. The descriptive statements were:

1. I feel I can learn to use a computer in more ways than I currently use it.

3. Computers will make it easier to get information I need when I need it.

5. I'm afraid that if I don't use computers, I'll be passed-by by others.

8. I use a computer on a daily basis.

10. I cannot afford to purchase a computer.

11. I have easy access to a computer.

12. Using a computer would conflict with my other job responsibilities.

14. I don't have time to use a computer.

17. Computers are changing so fast that when I become proficient with one, it will soon be out-of-date.

Statement number 8 from this section was used as a measure of computer experience.

Two statements were included to describe the subject's

attitude about the Internet. Those statements were:

15. I am willing to learn to use the Internet and
     other on-line services.

16. Everyone should have access to the Internet
     and other information on-line services.

Five statements from Section VI, Demographics, were

used in this study. Those statements and the possible

responses were:

A. Your gender.

   1. MALE

   2. FEMALE

B. Your present marital status.

   1. NEVER MARRIED

   2. MARRIED

   3. DIVORCED

   4. SEPARATED

   5. WIDOWED

D. Your present age: _____ YEARS

I. Which is the highest level of education that

   you have completed.

   1. LESS THAN HIGH SCHOOL

   2. COMPLETED HIGH SCHOOL (Diploma or
      equivalency)

   3. SOME COLLEGE

   4. COMPLETED ASSOCIATE, TWO YEAR, JUNIOR
      COLLEGE DEGREE

    5. COMPLETED BACHELOR'S DEGREE

    6. SOME GRADUATE WORK

    7. COMPLETED MASTER'S DEGREE

    8. COMPLETED DOCTORAL'S DEGREE

    9. COMPLETED PROFESSIONAL DEGREE (MD,DVM,ect)

    10. OTHER

O. What was your major type of production area in 1994?

    1. GRAIN CROP

    2. LIVESTOCK/POULTRY

    3. SPECIALTY CROP---OTHER THAN GRAIN

    4. COMBINATION (Please describe:_____)

The ages reported in Part D. were then recoded using SPSS so that an age of 40 or lower became a 1, an age of 41 through 50 became a 2, an age of 51 through 60 became a 3 and an age of 61 or higher became a 4. The combinations reported in part O. were all "livestock and crops" therefore, a 4 in this section will refer to livestock and crops instead of combination.

Using SPSS procedure "Reliability" and subcommand "Variables" on the responses to the 8 statements identifying barriers a Standardized Item Alpha of .7972 was calculated.

Data Collection

A Human Subjects Research Approval form was completed (Appendix H) and approved by the University Human Subjects Review Committee. To ensure the information given by the subjects would be pooled and that no link would be made to any individual, the surveys were coded. This code number was then used only to determine which instruments were returned and which were not.

Nineteen associations or organizations recorded below were willing to supply their mailing list or membership list for use in this study. The state education associations included in the list below were names of agriculture educators supplied by state government and not actual associations.

1. Illinois Agricultural Education Association

2. Illinois Farm Bureau

3. Illinois Seed Dealers

4. Iowa Agricultural Education Association

5. Iowa Farm Bureau

6. Iowa Poultry Association

7. Iowa Soybean Association

8. Iowa Veterinarian Association

9. Minnesota Agricultural Education Association

10. Minnesota Agri-Women

11. Minnesota Bankers Association

12. Minnesota Organic Growers and Buyers
    Association

13. Minorities in Agriculture, Natural
    Resources and Social Sciences

14. Missouri Agricultural Education
    Association

15. Nebraska Agricultural Education
    Association

16. South Dakota Agricultural Education
    Association

17. Wisconsin Agri-Business Council

18. Wisconsin Agricultural Education
    Association

19. Wisconsin Bankers Association

The initial mailing of 2265 Questionnaires was made on
January 10, 1995. This mailing included a cover letter
(Appendix C), a return envelope (postage paid and addressed)
and a copy of the instrument with a tea bag attached. The
tea bag was intended to provide refreshment for the subject
while completing the questionnaire.

A follow-up post card (Appendix D) was mailed on
January 25, 1995, to any subject who had not returned their
questionnaire. On February 10, 1995, a copy of the
instrument and cover letter (Appendix E) were mailed to 711
who had not responded to the first mailing or the follow-up
post card. A second post (Appendix F) card was mailed on
February 25, 1995, to those still not responding.

March 29, 1995, was determined to be the cut-off date.
Instruments returned after the cut-off date were not
included in this study. Of the 2265 surveys mailed 1083
were completed and returned. This represented a 48% return
rate.

Of the 364 questionnaires mailed to Iowa Soybean
Producers 141 were returned before the second mailing. By
March 29 two hundred and thirty-three were returned
including 34 returned blank leaving 199 usable
questionnaires. The return rate of completed questionnaires
was 55%.

Analysis of Data

The statistical analysis for this study was conducted
using a software program called Statistical Package for the
Social Sciences (SPSS). To prepare the data for SPSS the
responses were coded prior to entering the data on a
spreadsheet. The spreadsheet was developed on Quattro Pro
software. Some recoding had to be done after the data was
entered to incorporate any responses to "other" where the
subject could write in an answer. In the demographics
section age frequency was grouped into four categories. Two
variables, communication apprehension score and computer
anxiety score, were created using responses to some

statements and these variables were grouped into "high", "medium" and "low" categories.

Research Hypotheses

The first objective of this study was to identify the barriers to using new communication technology to deliver distance education. Identification of potential barriers was done through the literature review and focus groups. Communication apprehension (CA) scores and computer anxiety (CP) scores were computed. The magnitude of the barriers was reported in frequency tables.

The second objective of this study was to describe the extent to which different aspects of distance education technology contribute barriers to education. This objective was reported in frequency tables.

The third objective was to specify what experiences diminish the fears of distance education technology. This objective was tested with the following hypotheses:

Null Hypothesis # 1: There is no difference in the subject's perception of barriers among high, medium and low CA scores.

Null Hypothesis # 2: There is no difference in the subject's CP score among their different levels of computer

experience.

Null Hypothesis # 3: There is no difference in the
subject's perception of barriers
among high, medium and low CP
scores.

The fourth objective was to identify the demographics
of the participants in the study for comparison purposes.
The demographics were reported in frequency tables and
comparisons were made using the following hypotheses:

Null Hypothesis # 4: There is no difference in the
subject's perception of barriers
between men and women.

Null Hypothesis # 5: There is no difference in the
subject's perception of barriers
among different marital statuses.

Null Hypothesis # 6: There is no difference in the
subject's perception of barriers
among different age groups.

Null Hypothesis # 7: There is no difference in the
subject's perception of barriers
among different education levels.

Null Hypothesis # 8: There is no difference in the
subject's perception of barriers
among different types of
producers.

Because this study is investigating 8 barriers each null hypothesis testing the perception of barriers was computed 8 times, once for each barrier. Statistical procedures used included frequencies, analysis of variance and reliability. Alpha was set at .05 for all tests of significance.

PRESENTATION OF DATA

The purpose of this study was to determine the barriers, from the learners point of view, to education associated with the use of the latest technology in distance education delivery systems. The first objective was to identify the barriers of using new communication technology to deliver distance education. The second objective was to describe the extent to which different aspects of distance education technology contribute barriers to education. The third objective was to specify what experiences diminish the fears of distance education technology. The last objective was to identify the demographics of the participants in the study for comparison purposes.

A sample of 364 members of the Iowa Soybean Association was randomly surveyed. Out of that sample 199 responded. What follows is the frequency of their responses to the statements used for this study.

In Section III Part A statements 1 through 8 the subjects were asked to circle the appropriate number from the following:

1 Not a problem.

2 Problem but not difficult.

3 Moderately difficult problem.

4 Very difficult problem.

Section III also included this statement in the instructions: There is a class offered by your state's university that you have always wanted to take but is was too far to drive. Through new electronic technologies, the class is being offered at several sites around your state, one of which is your local high school. The new technology is an interactive delivery system that allows you to see and hear the instructor (who is at the university) and for the instructor to see and hear you. Other students at other sites will also be able to see and hear you.

The frequency of responses to the statements describing the barriers are found in Table 1. The numbers in Table 1 indicate that almost 46% of those who responded considered the lack of time to be a moderate to very difficult problem. The responses suggested that 86% of those who responded do not consider the drive to the local high school a difficult problem.

Only 11% of those who responded thought that being watched by a video camera or communicating by microphone were difficult problems. While 23% thought that the cost was too high

The interactive technology and being alone in a classroom were difficult problems for 13% of the subjects. The responses about the instructor being miles away show

Table 1: Frequencies and percentages of respones by selected members of the Iowa Soybean Association regarding barriers to using communication technologies

	Not a Problem		A Problem But Not Difficult		Moderately Difficult Problem		Very Difficult Problem		Total	
	f	%	f	%	f	%	f	%	f	%
Lack of time for class	29	15.6	71	38.2	64	34.4	22	11.8	186	100.0
Still too far to drive	134	71.7	27	14.4	17	9.1	9	4.8	187	100.0
Being watched by video camera	134	72.8	29	15.8	18	9.8	3	1.6	184	100.0
Communicating by microphone	121	65.8	43	23.4	17	9.2	3	1.6	184	100.0
Cost too much	69	37.5	73	39.7	11	16.8	11	6.0	184	100.0
The interactive technology itself	119	65.0	40	21.9	19	10.4	5	2.7	183	100.0
Nobody in the classroom with me	106	57.3	55	29.7	18	9.7	6	3.2	185	100.0
Instructor is miles away	140	75.5	33	17.8	11	5.9	1	0.5	185	100.0

that it was not a problem for 75% of those who responded and only one person called it a very difficult problem.

Communication preferences and learning activity patterns

In Section III Part C nine statements were listed and a response was requested by circling a number representing the appropriate reaction. The response choices were:

1 Strongly disagree.

2 Disagree.

3 Slightly disagree.

4 Slightly agree.

5 Agree.

6 Strongly agree.

The responses to these statements about communication preferences were recorded in Table 2.

Seventy percent of those who responded considered themselves to be outgoing. While 37% were, to some degree, afraid to express themselves in a group. Forty-three percent admitted that they talked less because they are shy and yet, 61% said they enjoyed responding to questions at a meeting.

One-half of the respondents thought that attending educational programs infringed on their family time but only 30% of them felt guilty about it. The numbers indicate that just 12% thought their family or spouse objected to their

Table 2: Frequencies and percentages of responses by selected members of the Iowa Soybean Association regarding communication references in educational activities

	Strongly Disagree		Disagree		Slightly Disagree		Slightly Agree		Agree		Strongly Agree		Total	
	f	%	f	%	f	%	f	%	f	%	f	%	f	%
I am basically an outgoing person	3	1.6	20	10.8	32	17.2	43	23.1	67	36.0	21	11.3	186	100.0
I am afraid to express myself in a group	24	12.8	62	33.2	31	16.6	43	23.0	23	12.3	4	2.1	187	100.0
I talk less because I am shy	22	11.8	60	32.1	25	13.4	51	27.3	23	12.3	6	3.2	187	100.0
I enjoy responding to questions a meetings	6	3.3	24	13.2	40	22.0	47	25.8	51	28.0	14	7.7	182	100.0
Attendance at educational programs generally infringes upon my family time	13	7.0	50	26.7	31	16.6	49	26.2	36	19.3	8	4.3	187	100.0
I tend to feel guilty when away from home or family for an education activity	20	10.8	78	41.9	26	14.0	41	22.0	18	9.7	3	1.6	186	100.0
My family/spouse objects to my outside activities	36	19.3	103	55.1	27	14.4	13	7.0	5	2.7	3	1.6	187	100.0
With all my other commitments, I just don't have time to attend educational activities	10	5.3	40	21.4	38	20.3	61	32.6	31	16.6	7	3.7	187	100.0
It is often difficult to arrange for child care so I can attend an educational activity	69	37.3	81	43.8	9	4.9	17	9.2	9	4.9	0	0.0	185	100.0

outside activities. Fifty-three percent agreed that because of other commitments they didn't have time for educational activities. Only 14% agreed that it was difficult to arrange for child care and nobody strongly agreed.

Computer-based technologies

Section III Part D contains 17 statements. The same response choices were available for Part D as were used in Part C. The respondents were to indicate their feeling towards each statement. The frequency of responses to the statements on computer based technologies were recorded in Table 3.

The data in Table 3 reveal that 92% of those who responded thought they could learn to use the computer more. While the numbers showed that 37% admitted that computers make them nervous. Over 92% agreed that computers will make information easier to get when it is needed. Forty-one percent confessed that computers scare them.

Seventy percent of the those who responded felt that they would be passed-by if they didn't use computers. And 90% of the respondents wanted to learn more about computers. The data indicate that 24% felt that a computer is so difficult to operate that they won't even buy one. To the statement about daily computer use 27% strongly disagreed and 12% strongly agreed.

Table 3: Frequencies and percentages of responses by selected members of the Iowa Soybean Association regarding computer based technologies

	Strongly Disagree		Disagree		Slightly Disagree		Slightly Agree		Agree		Strongly Agree		Total	
	f	%	f	%	f	%	f	%	f	%	f	%	f	%
I feel I can learn to use the computer in more ways than I currently use it	5	2.8	5	2.8	4	2.2	11	6.2	100	56.2	53	29.8	178	100.0
Working on a computer makes me nervous	28	15.8	62	35.0	21	11.9	33	18.6	26	14.7	7	4.0	177	100.0
Computers will make it easier to get information I need when I need it	1	.6	5	2.9	7	4.0	33	19.0	88	50.6	40	23.0	174	100.0
Computers do not scare me at all	8	4.5	36	20.3	28	15.8	26	14.7	56	31.6	23	13.0	177	100.0
I'm afraid that if I don't use computers, I'll be passed-by by others	11	6.2	25	14.0	18	10.1	41	23.0	65	36.5	18	10.1	178	100.0
I want to learn more about using computers	6	3.4	9	5.0	2	1.1	39	21.8	81	45.3	42	23.5	179	100.0
I would have a computer now, but they are too difficult to operate	48	27.9	72	41.9	11	6.4	25	14.5	13	7.6	3	1.7	172	100.0
I use a computer an a daily basis	47	26.6	41	23.2	10	5.6	23	13.0	34	19.2	22	12.4	177	100.0
I feel aggressive and hostile towards computers	59	33.3	69	39.0	23	13.0	20	11.3	4	2.3	2	1.1	177	100.0
I cannot afford to purchase a computer	53	30.3	65	37.1	17	9.7	19	10.9	11	6.3	10	5.7	175	100.0
I have easy access to a computer	20	11.2	25	14.0	7	3.9	9	5.1	62	34.8	55	30.9	178	100.0
Using a computer would conflict with my other job responsibilities	42	23.9	83	47.2	22	12.5	16	9.1	11	6.3	2	1.1	176	100.0
I feel confident in operating a computer	26	14.7	37	20.9	28	15.8	37	20.9	30	16.9	19	10.7	177	100.0
I don't have time to use a computer	33	18.6	62	35.0	35	19.8	33	18.6	9	5.1	5	2.8	177	100.0
I am willing to learn to use the Internet and other information on-line services	11	6.3	17	9.7	20	11.6	48	27.3	62	35.2	21	11.9	176	100.0
Everyone should have access to the Internet and other information on-line services	7	4.1	22	12.8	25	14.0	52	30.2	51	29.7	20	11.6	172	100.0
Computers are changing, when I become proficient with one, it will be out-of-date	6	3.4	32	18.0	25	14.0	62	34.8	41	23.0	12	6.7	178	100.0

The data reveal that 85% of those who responded did not feel aggressive and hostile towards computers. The data also indicate that 23% felt they cannot afford a computer. Seventy-one percent have easy access to a computer. Only 17% felt that a computer would conflict with other job responsibilities.

The numbers indicate that 49% of those responding felt confident operating a computer. Twenty-three percent don't have time to operate a computer. Seventy-four percent of those responding would like to learn to use the Internet and other information on-line services and 71% thought that everyone should have access to them. According to the numbers in Table 3 sixty-five percent thought that a computer would become obsolete as fast as they learn to use them.

Objectives

The first objective of this study was to identify the barriers of using new communication technology to deliver distance education. Eight barriers were considered and questionnaire responses were reported in Table 1.

Lack of time has consistently appeared as a barrier at or near the top of most lists of barriers. Therefore five statements were included to further analyze this barrier.

The frequency of responses were reported in Table 2.
Although about one half believe that educational activities
infringe upon family time only about one third feel guilty
about it. Only 11% felt that their family objected to them
participating in outside activities. Fifty-three percent
felt they didn't have the time for educational activities
because of other commitments. Finding child care
arrangements was a problem for 14%.

The second objective of this study was to describe the
extent to which different aspects of distance education
technology contribute barriers to education. The aspects
investigated in this study were the video camera, the
microphone, the technology itself, the possibility of being
the only one in a classroom and that the instructor is miles
away. The frequency of responses to statements relating to
these barriers can be found in Table 1.

With the exception of the instructor being miles away
the other 4 items were moderately difficult or very
difficult problems for roughly 12% of those responding.
That means that 1 person out of 8 found some aspect of the
technology to be a real problem. The instructor being miles
away was a moderately difficult problem for 6% and a very
difficult problem for only one person.

Two other barriers need to be discussed with computer
technology communications; communication anxiety (CA) and

computer anxiety (CP). The responses to four statements relating to CA are reported in Table 2. A CA score was computed from those responses and reported in Table 4. Over 8% had a high CA score; they are the ones that would avoid cameras and microphones and public speaking even in a class setting.

The responses to six statements relating to CP are reported in Table 3. A CP score was computed from those responses and reported in Table 4. Over 5% of those responding had a high CP score.

Ten statements were used to further analyze computer anxiety. The frequencies to those responses were also reported in Table 3.

Table 4: Frequencies and percentages of stratified scores calculated from responses by selected members of the Iowa Soybean Association to predetermined statements

| | CA Scores | | CP scores | |
	f	%	f	%
Low	67	37.0	76	45.5
Medium	99	54.7	82	49.1
High	15	8.3	9	5.4
Total	181	100.0	167	100.0

The third objective of this study was to specify what experiences diminish the fears of distance education technology. The two experiences investigated were computer experience and leadership activities.

The amount of leadership activities a person has been involved in was not directly measured in this study. Hawkins and Stewart (1991) report that those who scored higher in CA were rated both by themselves and by others to be lower in emerged leadership than those with lower CA. Someone who has been involved in leadership activities, such as committee chairperson or organization president, would have a low CA score. The members of the focus groups used early in this study were recruited because they were active in the community and therefore known by the recruiter. They probably had relative low CA scores. An instructor teaching a class, with these focus group participants as students, would not have to be concerned with communication apprehension.

CA score might relate to the perception of barriers. This was tested with Null Hypothesis # 1: There is no difference in the subject's perception of barriers among high, medium and low CA scores.

A one-way analysis of variance (ANOVA) was calculated to determine if there is significant variation at the .05

level. A one-way ANOVA involves the analysis of one
independent variable with two or more levels. Changes in
the dependent variable in an ANOVA are, or are presumed to
be, the result of changes in the independent variable
(Hinkle, Wiersma and Jurs, 1988, p. 329-330). In spite of
the name, ANOVA procedures are ultimately concerned with
means. However, inferences about means are drawn literally
from analysis of variances (Schmidt, 1975, p. 305). Null
Hypothesis # 1 suggested an ANOVA of CA score with the
barriers and because 8 barriers were being studied the ANOVA
was run 8 times.

Analyses of variance results were reported in Table 5.
The results of the tests show no significant differences in
the group means when CA scores were analyzed with statements
"Lack of time for class", "Cost" or "Nobody else in the
classroom with me". The null hypotheses for these three
cases were not rejected. A significant (at the .05 level)
difference was found between group means when CA scores were
analyzed with statements "Still too far to drive", "Being
watched by video camera", "Communicating by microphone",
"The interactive technology itself" and "Instructor is miles
away". The null hypotheses for these 5 cases were rejected.
The resulting conclusion was that there existed a difference
in the subject's perception of these 5 barriers among high,
medium and low CA scores. If people with high CA scores

Table 5: Analysis of Variance of group means in comparing barriers and demographic characteristics reported by selected members of the Iowa Soybean Association

	CA F Prob.	CP F Prob.	Age F Prob.	Education Level F Prob.	Type of Production F Prob.
Lack of Time for Class	.8444	.5288	.1086	.0596	.0266*
Still too far to Drive	.0273*	.2846	.0326*	.2813	.2983
Being Watched by Video Camera	.0000**	.2228	.5037	.2909	.3122
Communicating by Microphone	.0000**	.0125*	.3095	.0152*	.2785
Costs too Much	.3002	.6993	.5562	.4399	.6388
The Interactive Technology Itself	.0027**	.0001**	.0000**	.0499	.0091*
Nobody in the Classroom with Me	.0611	.0007**	.1017	.0132*	.2107
Instructor is Miles Away	.0015**	.0101*	.3068	.0106*	.1586
I use a Computer on a daily Basis		.0000**			

* Significant at the 0.05 level
** Significant at the 0.01 level

rate low in emerged leadership, as suggested by Hawkins and Stewart (1991), then those rated low in emerged leadership would have a problem with the same barriers as those with high CA scores.

Computer anxiety

The existing literature disagrees on the subject of computer experience diminishing computer anxiety. This was tested with Null Hypothesis # 2: There is no difference in the subject's CP score among their different levels of computer experience. The responses to statement in Section III Part A Number 8, "I use a computer on a daily basis", were used as a measure of computer experience. A one-way analysis of variance (ANOVA) was calculated to determine if there was significant variation at the .05 level.

A significant (at the .05 level) difference was found (Table 5). Therefore Null Hypothesis # 2 was rejected and the research hypothesis was accepted. That hypothesis indicated that there was a difference in the subject's CP score among the different levels of computer experience. It can then be concluded that the results from this study support the theory that computer experience does diminish computer anxiety.

To complete this study of computer experience a test was needed of Null Hypothesis # 3: There is no difference in the subject's perception of barriers among high, medium and low CP scores. A one-way analysis of variance (ANOVA) was calculated to determine if there is significant variation at the .05 level. Because there were 8 barriers tested the ANOVA was computed for all 8 and reported in Table 5.

In 4 of the cases, "Lack of time for class", "Still too far to drive", "Being watched by video camera" and "Costs too much", Null Hypothesis # 3 was not rejected. In the other 4 cases, "Communicating by microphone", "The interactive technology itself", "Nobody else in the classroom with me" and "Instructor is miles away", Null Hypothesis # 3 was rejected. Therefore the research hypothesis was accepted. There is a difference in the subject's perception of 4 of the barriers among high, medium and low CP scores.

If computer experience lowers CP scores and those with low CP scores have less of a problem with some barriers then it follows that computer experience will diminish the perception of those barriers being barriers.

The last objective was to identify the demographics of the participants in the study for comparison reasons. The frequencies of responses are reported in Tables 6 through 10.

Five items were used from section VI, demographics.

Part A was gender with the following coding:

1 Male.

2 Female.

Part B was martial status and it was coded:

1 Never married.

2 Married.

3 Divorced.

4 Separated.

5 Widowed.

There was not anyone who indicated they were separated or widowed. Part D was age and it was recoded into the following groupings:

1 Lowest through 40.

2 41 through 50.

3 51 through 60.

4 61 through highest.

The groups were determined by the researcher and roughly coincide with natural breaks in the original data.

The information found in Table 6 shows that only 10 women completed the questionnaire. And the information from Table 9 tells that 92% of those who responded were married and only 1% was divorced. The numbers in Table 7 indicated 20% are 40 years old or younger.

Table 6: Frequencies and percentages of responses by
selected members of the Iowa Soybean Association
regarding gender

	Gender	
	f	%
Male	179	94.7
Female	10	5.3
Total	189	100.0

The last two items under demographics were education level and major type of production. Part I was education level with the following options:

1   Less than high school.

2   Completed high school (diploma or equivalency).

3   Some college.

4   Completed associate, two-year, junior college degree.

5   Completed bachelor's degree.

6   Some graduate work.

7   Completed master's degree.

8   Completed doctoral's degree.

9   Completed professional degree (MD, DVM, ect.).

10 Other (specify) _____.

The only "other" listed was a trade school.

Table 7: Frequencies and percentages of responses by
selected members of the Iowa Soybean Association
regarding age, grouped for reporting and analysis
purposes

	Age	
	f	%
40 & Younger .	38	20.2
41 Thru 50	67	35.6
51 Thru 60	49	26.1
61 & Older	34	18.1
Total	188	100.0

Part O was the major type of production in which the respondent was involved. The following choices were offered:

1 Grain crop.

2 Livestock/poultry.

3 Specialty crop-other than grain.

4 Combination (please describe: _____).

All of the combinations reported were livestock and crops.

The numbers in Table 8 show that, of those responding, 28% said their highest level of education was graduating from high school and 32% said their highest level was earning a bachelor's degree.

Table 8: Frequencies and percentages of responses by
selected members of the Iowa Soybean Association
regarding education level

| | Education Level | |
	f	%
Less than H.S.	4	2.2
H.S. Grad	51	27.9
Some College	28	15.3
2-Year Degree	24	13.1
B.S. Degree	58	31.7
Some Grad Work	10	5.5
M.S. Degree	4	2.2
Ph.D. Degree	1	.5
Professional Degree	2	1.1
Other	1	.5
Total	183	100.0

Grain crops, either alone or in combination with
livestock, were the major type of production for 90% of
these responding (Table 10). The directions on the
questionnaire instructed those not involved in production
agriculture to not respond to this question. That
nonresponse by some would explain the 37 missing appearing
in Table 10.

Table 9: Frequencies and percentages of responses by
selected members of the Iowa Soybean association
regarding marital status

	Martial Status	
	f	%
Never Married	13	6.9
Married	174	92.1
Divorced	2	1.1
Separated	0	0.0
Widowed	0	0.0
Total	189	100.0

The comparisons with the demographics were made by testing

hypotheses 4 through 8. The test used for each hypothesis

was a one-way ANOVA. In each case the particular feature

from the demographics was tested with the 8 barriers.

Null Hypothesis # 4: There is no difference in the

subject's perception of barriers between men and women.

The ANOVA was computed and in all 8 cases the null

hypothesis was not rejected. Probably no conclusions should

be drawn from this as there were only 10 women (Table 6) who

responded to the questionnaire.

Table 10: Frequencies and percentages of responses by
          selected members of the Iowa Soybean Association
          regarding major type of production

	Production Type	
	f	%
Grain Crop	98	60.5
Livestock/Poultry	14	8.6
Specialty Crop	2	1.2
Livestock/Crops	48	29.6
Total	162	100.0

Null Hypothesis # 5: There is no difference in the subject's perception of barriers among different marital statuses. The ANOVA was computed and in all 8 cases the null hypothesis was not rejected. Again no conclusions should be drawn as over 92% reported that they were married.

Null Hypothesis # 6: There is no difference in the subject's perception of barriers among different age groups.

Of the 8 tests of Null Hypothesis # 6 only 2 resulted in rejection. The research hypotheses that were accepted were: 1. there is a difference in the subject's perception of the barrier "Too far to drive" among different age groups; 2. there is a difference in the subject's perception of barrier "The interactive technology itself" among different age groups.

Null Hypothesis # 7: There is no difference in the subject's perception of barriers among different education levels.

Of the 8 tests of Null Hypothesis # 7 three resulted in rejection. The research hypotheses that were accepted were: 1. there is a difference in the subject's perception of the barrier "Communicating by microphone" among different education levels; 2. there is a difference in the subject's perception of barrier "Nobody else in the classroom with me" among different education level groups; 3. there is a difference in the subject's perception of barrier "Instructor is miles away" among different education levels.

Null Hypothesis # 8: There is no difference in the subject's perception of barriers among different types of producers.

Of the 8 tests of Null Hypothesis # 8 two resulted in rejection. The research hypotheses that were accepted were: 1. there is a difference in the subject's perception of the barrier "Lack of time for class" among different types of producers; 2. there is a difference in the subject's perception of barrier "The interactive technology itself" among different types of producers.

CONCLUSIONS AND RECOMMENDATIONS

The purpose of this study was to determine the barriers, from the learners point of view, to education associated with the use of the latest technology in distance education delivery systems. Through a review of the literature and information gained from focus groups eight barriers were listed on the questionnaire. Those receiving the questionnaire were asked to rate each as to the size of a problem it presented to them. In addition, to the eight barriers listed, communication apprehension and computer anxiety were studied.

The membership of the Iowa Soybean Association was sampled. One hundred and ninety-nine usable questionnaires were returned. Frequency and ANOVA tables were used to present the data.

Conclusions

From the frequency tables compiled about the demographics a profile can be constructed of the sample population. The average respondent is male, married and between the ages of 40 and 60. He is a grain or grain and livestock farmer. He is well educated with 68% having some schooling past high school and 29% holding Bachelor's Degree.

Forty-six percent of those responding thought the lack of time for class was a moderately difficult or very difficult problem. The ANOVA with "Lack of time for class" and "major type of production" indicated that the livestock and crops group considered the lack of time more of a problem than the other groups.

High communication apprehension (CA) scores were calculated for 8.3% and high computer anxiety (CP) scores were calculated for 5.4%.

Half of those responding thought that educational activities infringed upon their family time, while only one third felt guilty about it. For the most part they did not feel their family or spouse objected to their outside activities but they just had too many other commitments that did not leave time for education. Finding child care was not considered a big problem.

Driving to the local high school to attend a class was not a difficult problem for most of the respondents. The ANOVA with "Still too far to drive" and "age" indicated the age group 61 and older had a significantly bigger problem with driving that did the 40 and younger age group.

Being watched by a video camera was a difficult problem for 11.4%. The ANOVA with "Being watched by a video camera" and "CA scores" indicated that those with high and medium CA scores had a significantly bigger problem with this barrier.

Communicating by microphone was a difficult problem for 10.8%. Those with high and medium CA scores had a bigger problem with the microphone than did those with medium CP scores. The respondents who had completed high school had a significantly bigger problem with the microphone than did those who had completed their Bachelor's Degree.

Over three-fourths of the respondents thought cost was either not a problem or not a difficult problem. Of all the measures tested there was no significant differences found with regard to cost.

The interactive technology was a difficult problem for 13.1%. The older age group had a significantly bigger problem with the technology than the other age groups. Those with high CA scores and those with medium and high CP scores had a significantly bigger problem with the technology.

Ninety-two percent of those responding felt they could use a computer more and a computer would make it easier to get information. Seventy percent had easy access to a computer and felt if they didn't use it they would be passed by. Twenty-three percent couldn't afford a computer. Twenty-seven percent didn't have time to use a computer and 17% felt using a computer would conflict with other job responsibilities. Sixty-five percent though that computers are changing so fast that when they become proficient with

one it will be out-of-date. About three fourths were
willing to use the Internet and thought everyone should have
access to it.

Being alone in the classroom was a difficult problem
for 12.9%. Those with high and medium CP scores had a
significantly bigger problem with   "Nobody else in the
classroom with me". This barrier was also significantly
more of a problem for high school graduates than for those
with a Bachelor's Degree.

The instructor being miles away from the classroom was
not a problem for 76%. This barrier was a difficult or very
difficult problem for 6.4%. Those with high and medium CA
score had a significantly bigger problem as did those with
medium CP scores. The group of respondents with less than
high school graduation had a significant problem with this
barrier compared to the 5 other education groups from those
that have completed high school to those with some graduate
work.

This study concurred with a majority of previous
studies that reported time and cost as being the two
barriers that created the most problems, although cost was
not a difficult problem for 77% of those responding.

The drive to the local high school was not a problem
for 86% and for the most part the ones who had a problem
with the drive were in the 61 and older age group. The

camera, the microphone and the technology were difficult problems for roughly 12%. Those with high CA scores had a problem with all three and those with high CP scores had a problem with the microphone and the technology.

People with emerged leadership skills tend to have lower CA scores than those without emerged leadership skills (Hawkins and Stewart, 1991). The more leadership activities someone has in their background the less of an effect the barriers of camera, microphone and technology will probably have. And the lower their CA score the less of an effect the barriers of camera, microphone and technology will probably have.

With an interactive delivery system the possibility exists that only one student would enroll for a class at a particular site. Being the only one in the classroom was a difficult problem for 13% of these responding, while the idea that the instructor is miles away was a difficult problem for only one half of as many.

The ANOVA with computer experience and CP score produced strong evidence that the more computer experience people have the lower their computer anxiety score. This analysis does not specify whether computer experience reduces computer anxiety or people with little computer anxiety use computers. Either way someone with a low CP score or with some computer experience would probably not

find the technology involved with distance education a barrier.

Assessments

The review of the literature and casual observations led to the conclusion that barriers of great validity restrained potential learners from participating in educational activities. The results of this study revealed that barriers, as rated by selected members of the Iowa Soybean Association, were not so great. The barriers, if they were rated as a problem at all, seemed to be little more than excuses.

Questions raised early in this thesis (page 10) asked if enrollment or participation would increase with the use of the Iowa Communication Network (ICN) as a delivery method for educational activities. The results of this study indicate that only a few of those who responded would be held back by barriers. Seventy percent of those who responded have already participated in some form of schooling since they graduated from high school. Very little exists in the way of true barriers, therefore these potential learners need only motivation to participate. The following recommendations were made based on this assessment.

Recommendations

Program planners and instructors need to know pertinent
details about potential students so informed decisions can
be made. This information may have implications for future
planning and implementation. Although relevant information
will vary from one planning situation to another, the
following items represent a sampling from the literature:
age, educational attainment, cultural background, facility
with the language, economic status, history of participation
in education, geographic distribution, and social
affiliations (Sork and Caffarella, 1989, p. 236). This
study was an example of how a profile of potential students
was developed. Great care must be taken so as not to assume
that everyone fits this profile. The profile is a
collection of averages. Those at the outer edges should not
be ignored.

Analysis of potential students should reveal any
characteristics that may have important implications later
in the planning process. For example, the analysis may
reveal that lack of time and money is a formidable barrier
to participation for most. Without this knowledge, serious
errors could be made in the design, pricing, and promotion
of the program (Sork and Caffarella, 1989). In addition to
the lack of time and money, other characteristics important
to distance education are emerged leadership, computer

experience, and if possible, a CA and CP score. The program planner and the instructor, whether the same person or not, can more finely tune the program to the individuals that will be taking the class if they know the characteristics of those individuals. If time permits a questionnaire could be sent to students between the time of enrollment and the first day of class. Or a questionnaire could be completed the first time the class meets.

If a class delivered over the ICN was made up of people active in the community, as participants of the focus groups used in the early development of this study, then there would probably be little concern about communication apprehension. To be active in the community would require some emerged leadership. However, if a programmer did not know about this leadership characteristic, an assumption would have to be made that there are some people enrolled who would test high in CA. The programmer is then faced with three alternatives, 1. attempt to determine who has the high CA scores, 2. treat the class as if everyone is communication apprehensive, or 3. risk losing those with high CA. When those with high scores are identified a supplemental program could be implemented, for them, to help them deal with their CA.

The program planner for this class should also investigate computer anxiety. The same methods could be used to find either computer experience or a CP score.

Suppose 24 people enrolled in this class from the target population of this study. One would expect about 11% who have a problem with using the equipment (camera and microphone) and about 12% who have a problem with the technology, or roughly 1 in every 8.5 students. Therefore if 25 students were enrolled there would be 3 drop out who were afraid to use the equipment, even if these were the same people that were afraid of the technology. If those who were afraid to use the equipment were not the same as those who were afraid of the technology then there would be 6 drop out.

Marketing education

The university should be client oriented. This is the latest way of saying that the university is here to serve the people. Without the ability to attract students the institution would cease to exist and therefore could not serve its clients. Both serving the client and attracting the client are objectives of marketing orientation. Marketing orientation holds that the main task of the institution is to determine the needs and wants of target markets and to satisfy them through the design,

communication, pricing and delivery of appropriate and
competitively viable programs and services (Kotler and Fox,
1995, p. 8).

The view that an industry is a customer-satisfying
process, not a goods-producing process, is vital for all
business people and educators to understand. The marketing
view is that the entire business process consists of a
tightly integrated effort to discover, create, arouse and
satisfy the customer needs (Levitt, 1960).

Part of a marketing strategy is a marketing mix. A
marketing mix has four basic variables, called the four P's:
product, place, promotion, price (McCarthy, 1979). The most
effective institutions understand the role and importance of
each component of the marketing mix and use the tools in an
integrated way to appeal to and serve their selected target
markets (Kotler and Fox, 1995, p. 8).

Marketing is not something used just by the business
segment to attempt to make a profit. Marketing can and
should be used by an educational institution to serve its
clients.

Promotion

Promotion is communicating between seller and buyer to
change attitudes and behavior. _Promotion_ tells target
customers that the right _product_ is available at the right

place at the right price (the four P's). Consumer buying is a problem-solving process. This process follows the six steps in the adoption process (previously discussed on pages 43 and 44). Promotion objectives can be related to the various steps in the adoption process (McCarthy, 1979). The interest and evaluation steps of the adoption process can be affected by stating the benefits, to the client, of making a positive response.

How well a program is promoted is a factor in its success. One reason for advertising and promoting a program is informational, to let people know about it. This information would include the title of the program, what it is about, where it will be presented, when it will be presented and in what format it will be presented. In distance education the format might be correspondence, or video tapes, or using the ICN for example. It could be a combination of delivery methods. A good advertising campaign will also tell a perspective student what they would gain by attending. This last point about benefits to the prospective student should be the main emphasis of the advertising.

Another thing that an advertising campaign should do is attempt to convince prospective students that a barrier will be easy to overcome. This research was done not to develop advertising but to suggest how the results might be used.

Therefore the suggestions about particular advertising are guidelines only, the particulars should be left to advertising professionals.

The lack of time is the biggest barrier reported in this study and many others. Because virtually all distance education programs face the barrier of time maybe a department or college or even an entire institution could design a campaign to suggest to people that this is not such a big problem. Perhaps a slogan such as: If you have the mind, you have the time.

Certainly the use of the ICN decreases driving time for many students but time is still a barrier. Even so, this decrease in driving time could be emphasized in promotional material.

Cost is another barrier reported by most studies and although it is considered a difficult problem by only 23% in this study that is still a substantial amount. It may be possible for a marketing plan to include group rates or early enrollment discounts. Even if this type of incentive is not possible, cost could be confronted by elaborating on the value to be gained from the class, and explaining how much that value exceeds the cost.

Offering a free computer class to anyone who enrolls for a program offered over the ICN might accomplish two things. It would be a promotion for the course and it would

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help the student to become familiar with the interactive system. Thereby decreasing the anxiety level and allowing both the student and the instructor the opportunity to move quickly into the subject matter of the course.

Other barriers such as, the fear of the camera, the fear of the microphone, the fear of the technology, the fear of being alone in the classroom and the concern of knowing the instructor is miles away can be challenged in promotional material.

Courses, programs or classes, whether for credit or only for information, offered by the university over the ICN need to be promoted. The university's clients deserve to know about those offerings and the potential benefits.

Summary

Summary

A state university should attempt to deliver quality programs to all citizens of the state on a cost-effective basis (Iowa Board of Regents, 1990). In theory the state university should conduct itself altruistically. Realistically the university must live within certain budget restraints.

By the time a course has been designed and promoted and is ready to be presented most of the costs have been determined. An increase in enrollment over projections would add to the income side of the ledger but have little

effect on the expense side. Depending on the refund policy a decrease in the drop out rate would have the same effect.

The business world uses a marketing plan, it promotes and advertises its products and services. Part of the marketing plan involves anticipating objections and defusing them. What salesmen call objections educators call barriers. Another part of the marketing plan attempts to sell the benefits of the product instead of the product itself.

Studies on the reasons people have for not enrolling in educational activities should be used to anticipate possible barriers. It may be necessary to identify people with certain barriers so that special programs can be offered to help them overcome their anxiety. Advertising and promotions can also counteract barriers.

Limitations

The barriers investigated in this study were identified from the literature and other groups of people. The other people were the members of the focus groups and not necessarily members of the Iowa Soybean Association. The selected members of the Iowa Soybean Association were "given" these barriers. These barriers were imposed upon them. Pre-labeling these issues as barriers could have had an effect up on the subsequent results.

If this study was repeated it might be improved if the participants were asked to identify their barriers. After they had identified their barriers the participants could then rate the degree of difficulty that the barriers posed to their involvement in educational activities.

It is not possible to determine what effect this imposition if barriers had, if it had any at all. The potential exists and should be considered by future researchers in this field.

Recommendations for Further Research

Although a vast amount of research has been conducted on distance education much of it is not current and should be reviewed in light of the technologies available in distance delivery. The research on barriers usually identifies the barriers but offers little in suggestions of how to overcome the barriers.

Recommendations for further study more closely related to this study:

1. A study of the barriers to education associated with the latest technology in distance delivery systems from the instructor's point of view.

2. A study to determine the best type of program to diminish communication apprehension.

3. A study to determine the best type of program to diminish computer anxiety.

4. A study to determine the best type of
   advertising campaign to overcome a
   barrier.

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APPENDIX A.   FOCUS GROUP MODERATOR'S GUIDE

Introductions

What is your biggest concern as it relates to agriculture?

A. Think back to the last time you needed to get information to solve a problem. What was the problem?

OR

Thinking back over the past months, what changes have occurred in your business (farming operation)?

B. When you solved the problem (or made the change), where did you get the information?

C. Which of the following media sources do you have access to?
- one to one
- phone call
- newsletter
- meeting
- workshop
- bulletin
- audio cassette tape
- videotape
- live broadcast — no interaction
- live broadcast — interaction possible

D. How valuable is timely, accurate information to you?

E. What are your general perceptions of ISU

F. What are your general perceptions of the College of Agriculture?

G. What are your impressions of information from ISU's College of Agriculture?

1. Is the information timely?

2. Is it accurate or biased?

3. Is it practical and useful?

H. How does the College of Agriculture compare to the other sources of information you utilize?

I. What can or should the College of Agriculture do to provide better quality information?

J. What can or should the College of Agriculture do to provide information to more *(audience type)*?

K. Here is information about the Professional Agriculture degrees (B.S. & M.A.).
   1. Which parts of this program are of interest to you?
   2. Which requirements would stop you from participating?
   3. How do you feel about
      a. the cost of tuition? (about $6.00/hr for undergraduate; $10/hr for graduate level)
      b. the location of the course?
      c. the time of day or month of the course?
      d. the instructors?
      e. when the instructor is not in the room (learning via videotape or ICN)?
      f. when your the only student there?

L. Take a look at these outlines for the courses. What would it take to get you to attend one of these courses? (Probe: What needs to be done to get people like yourself to attend?)

M. Ole or Tom — do you have any questions?

N. Closing comments from everyone

• **THANK YOU!!!**

APPENDIX B. COVER LETTER FOR FIELD TEST

IOWA STATE UNIVERSITY 116

OF SCIENCE AND TECHNOLOGY

Department of Agricultural Education and Studies
201 Curtiss Hall
Ames, Iowa 50011-1050
Administration and Graduate Programs 515 294-5904
Research and Extension Programs 515 294-5872
Undergraduate Programs 515 294-6924

December 5, 1994

Dear

Season's Greeting participants of our Distant Education focus groups! For some of the groups, it has been awhile since your thoughts were centered on Distant Education at ISU. Your involvement with our focus group discussion were very rewarding and informational. With the information, we have completed a questionnaire and would like additional input. When completed, this questionnaire will be sent to a random sample of people involved with agriculture in the Midwest. Your input, on the questionnaire, will assist us in making the necessary revisions.

Please complete the enclosed questionnaire. The survey has 6 parts. Part I contains questions to determine your personal interest in and understanding of distance education and electronic communication technologies. Part II contains questions about the sources of information you utilize in daily career and business decisions. Part III contains questions to determine your personal use and understanding of electronic communication technologies. Part IV contains statements to identify agriculture topics and issues that are of importance to you. Part V contains selected statements regarding your perceptions of Iowa State University and it's College of Agriculture. Part VI contains questions to identify selected demographic data about professionals in agriculture. Please complete all six parts of the questionnaire. The questionnaire should take approximately 15-20 minutes to complete. Also, when completing the questionnaire we would like you to record the exact time of starting and stopping.

The information that you provide will be held in strict confidence. Individual responses will not be made available to anyone. The individual questionnaires will be destroyed following analysis of the information. Again, the primary purpose of completing the questionnaire is assisting in the revision process.

We hope you will take a few minutes to help us. Please return the completed questionnaire by December 12, 1994. A self-addressed return envelope is provided for your convenience in returning the questionnaire. We appreciate your participation.

If you have any questions, please feel free to contact us at anytime (1-800-747-4478).

Sincerely,

Tom Jordan
Research Assistant

Dr. David L. Doerfert
Coordinator of ISU's
Professional Agriculture
Programs

APPENDIX C. FIRST MAILING COVER LETTER

IOWA STATE UNIVERSITY

OF SCIENCE AND TECHNOLOGY

January 1995

Department of Agricultural Education and Studies

201 Curtiss Hall

Ames, Iowa 50011-1050

Administration and Graduate Programs 515 294-5904

Research and Extension Programs 515 294-5872

Undergraduate Programs 515 294-6924

Dear

The College of Agriculture and the Off-Campus Professional Agriculture Program at Iowa State University is conducting a study to identify the educational and informational needs of agriculturists in the Midwest. More specifically, what distance education systems can be used effectively to meet these identified learning needs. As a professional in the agriculture industry, you have been selected to participate in this study. The educational and informational needs of agriculturists cannot be met without input from those who work within the industry. Therefore, your perceptions and comments are critical to this study and future programming efforts.

Please complete the enclosed survey questionnaire. The survey has 6 parts. Part I contains questions to determine your personal interest in and understanding of distance education. Part II contains questions about the sources of information you utilize in daily career and business activities. Part III contains questions to determine your personal use and understanding of electronic educational technologies. Part IV contains statements to identify agriculture topics and issues that are of importance to you. Part V contains selected statements regarding your perceptions of Iowa State University and its College of Agriculture. Part VI contains questions to identify selected demographic data about professionals in agriculture. Please complete all six parts.

You may be assured of complete confidentiality. The questionnaire has an identification number for mailing purposes only. This is so that we may check your name off of the mailing list when your questionnaire is returned. Your name will never be placed on the questionnaire or in the final report. Participation is voluntary and if you do not wish to respond, please return the unused questionnaire.

The results of this research will be made available to administrators and faculty within the College of Agriculture and at Iowa State University and all interested citizens. You may receive a summary of the results by writing "copy of results requested" on the back of the return envelope, and printing your name and address below it. Please do not put this information on the questionnaire itself.

I hope that you will take the time to help us. Based on field test results, the questionnaire should take 20-30 minutes to complete. To help you through the process of completing the questionnaire, I have enclosed a *Lipton* tea bag for your enjoyment.

Please return the completed questionnaire by **Tuesday, January 17, 1995**. A return envelope is provided for your convenience in returning the questionnaire — no postage is necessary.

I would be most happy to answer any questions you might have. Please call me at 1-800-747-4478.

Thank you for your assistance.

Sincerely,

Dr. David L. Doerfert
Coordinator of ISU's Off-Campus
   Professional Agriculture Degree Programs

Tom Jordan
Research Assistant

APPENDIX D. FIRST POST CARD REMINDER

January 24, 1995

Last week a questionnaire seeking your opinions about your educational and informational needs as they pertain to agriculture was mailed to you. Your name was drawn in a random sample of agriculturists in the Midwest.

If you have already completed and returned it to us please accept our sincere thanks. If not, please do so today. Because the questionnaire has been sent to only a small, but representative, sample of agriculturist it is extremely important that yours be included in the study if the results are to accurately represent the educational and informational needs of agriculturists.

If by some chance you did not receive the questionnaire, or it got misplaced, please call me right now, toll-free (1-800-747-4478) and I will get another one in the mail to you today.

Sincerely,

David L. Doerfert
Project Director

APPENDIX E.   SECOND MAILING COVER LETTER

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

February 1995

Dear

About four weeks ago I wrote to you seeking your perceptions and comments on the educational and informational needs of agriculturists in the Midwest. As of today we have not yet received your completed questionnaire.

Our research unit has undertaken this study because of the belief that public opinion should be used for the formation of policies and the development of future programming that is delivered by distance education technologies. Our unit also believes that better education programming efforts will positively impact agriculture and the communities in which people live.

I am writing you again because of the significance each questionnaire has to the usefulness of this study. Your name was drawn through a scientific sampling process in which agriculturists in the Midwest had an equal chance of being selected. This means that only one out of every 2,500 agriculturists in the Midwest are being asked to complete this questionnaire. In order for the results of the study to be truly representative of the opinions of Midwestern agriculturists, it is essential that each person in the sample return his or her questionnaire.

In the event that your questionnaire has been misplaced, a replacement is enclosed. Please return the completed questionnaire by March 7, 1995. A return envelope is provided for your convenience in returning the questionnaire — no postage is necessary.

Your cooperation is greatly appreciated.

Sincerely,

Dr. David L. Doerfert   Tom Jordan
Coordinator of ISU's Off-Campus   Research Assistant
  Professional Agriculture Degree Programs

P.S.   A number of people have written to ask when results will be available. We hope to
        have them mailed by June 1.

APPENDIX F. SECOND POST CARD REMINDER

March 1995

Two weeks ago a 2nd questionnaire seeking your opinions about your educational and informational needs as they pertain to agriculture was mailed to you.

If you have already completed and returned it to us please accept our sincere thanks. If not, please do so today. Because the questionnaire has been sent to only a small, but representative, sample of agriculturist it is extremely important that yours be included in the study if the results are to accurately represent the educational and informational needs of agriculturists.

If by some chance you did not receive the questionnaire, or it got misplaced, please call me right now, toll-free (1-800-747-4478) and I will get another one in the mail to you today.

Sincerely,

David L. Doerfert
Project Director

APPENDIX G.   SURVEY INSTRUMENT
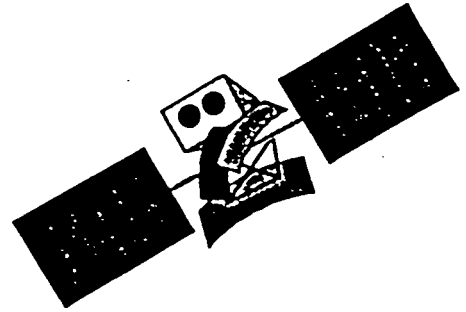
Distance Education in Agriculture: Understanding Your Educational & Informational Needs
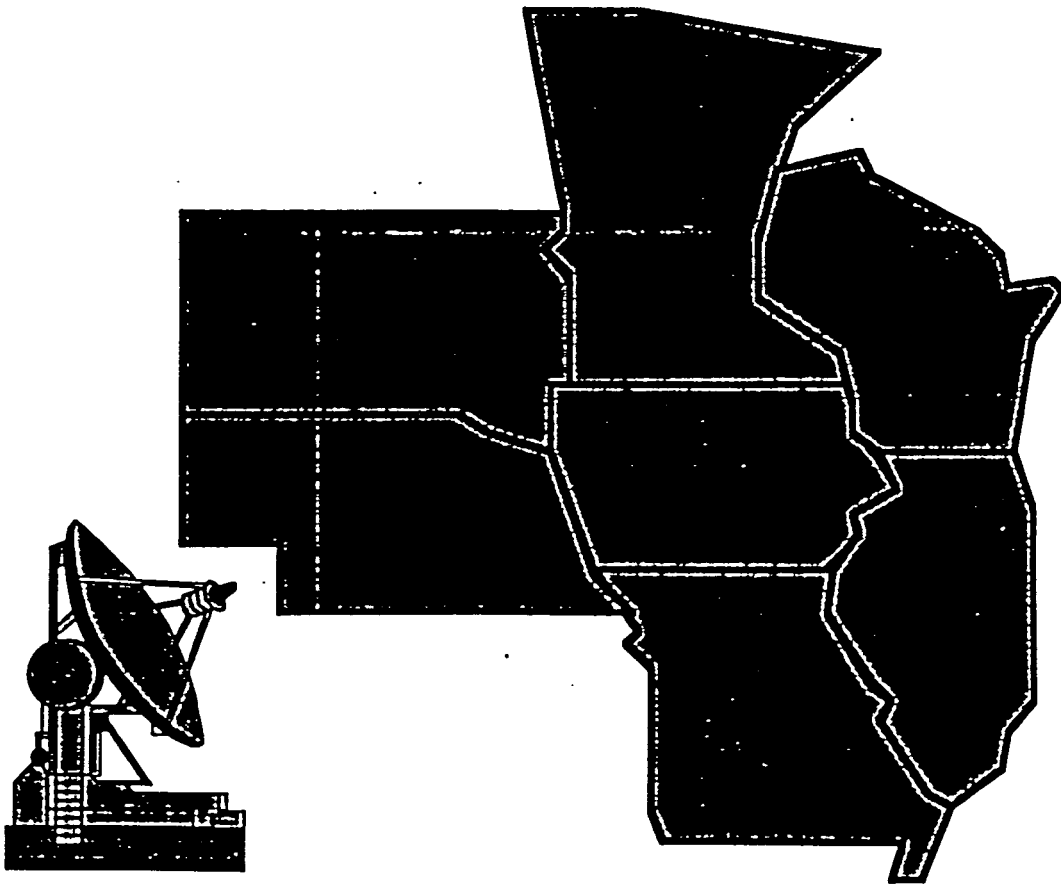
IOWA STATE UNIVERSITY
COLLEGE OF AGRICULTURE

January 1995

The College of Agriculture and the Off-Campus Professional Agriculture Program at Iowa State University is conducting a study to identify the educational and informational needs of agriculturist in the Midwest. More specifically, what distance education means can be used to meet these identified learning needs. As a professional in the agriculture industry, you have been selected to participate in this study. The educational and informational needs of agriculturalist cannot be met without input from those who work within the industry. Therefore, your perceptions and comments are critical to this study and future distance education programming efforts.

Please complete the enclosed survey questionnaire. The survey has 6 parts. Part I contains questions to determine your personal interest in and understanding of distance education. Part II contains questions about the sources of information you utilize in daily career and business activities. Part III contains questions to determine your personal use and understanding of electronic educational technologies. Part IV contains statements to identify agriculture topics and issues that are of importance to you. Part V contains selected statements regarding your perceptions of Iowa State University and it's College of Agriculture. Part VI contains questions to identify selected demographic data about professionals in agriculture. Please complete all six parts.

You may be assured of complete confidentiality. The questionnaire has an identification number for mailing purposes only. This is so that we may check your name off of the mailing list when your questionnaire is returned. Your name will never be placed on the questionnaire or in the final report. Participation is voluntary and if you do not wish to respond, please return the unused questionnaire.

The results of this research will be made available to administrators and faculty within the College of Agriculture and at Iowa State University and all interested citizens. You may receive a summary of the results by writing "copy of results requested" on the back of the return envelope, and printing your name and address below it. Please do not put this information on the questionnaire itself.

I hope that you will take the time to help us. Based on field test results, the questionnaire should take 20-30 minutes to complete. To help you through the process, I have enclosed an instant beverage for your enjoyment while completing the questionnaire.

Please return the completed questionnaire by Friday, January 13, 1995. A self-addressed return envelope is provided for your convenience in returning the questionnaire.

I would be most happy to answer any questions you might have. Please call me at 1-800-747-4478.

Thank you for your assistance.

Sincerely

Dr. David L. Doerfert
Coordinator of Off-Campus Professional
Agriculture Degree Programs

I. DISTANCE EDUCATION NEEDS

At its most basic level, distance education takes place when a teacher and student(s) are separated by physical distance, and technology (such as audio, video, data, and/or print) is used to bridge the distance. This section seeks your understanding, attitudes, and needs for learning at a distance.

A. When was the last time you were enrolled in a college-credit course? (Circle number of your answer)

1. I HAVE NEVER ENROLLED IN A COLLEGE COURSE
2. LESS THAN 1 YEAR AGO
3. 1 OR MORE BUT LESS THAN 5 YEARS AGO
4. 5 OR MORE BUT LESS THAN 10 YEARS AGO
5. 10 OR MORE YEARS AGO

B. Who is most likely to decide if you or your group/business will subscribe to educational/ training programming? (Circle number of most likely decision maker)

1. SELF
2. IMMEDIATE SUPERVISOR
3. TRAINING DIRECTOR
4. ASSOCIATION PRESIDENT OR VICE PRESIDENT
5. OFFICER BOARD
6. OTHERS IN ASSOCIATION

C. What is the most, second, and third most critical factors that influence your decision to subscribe to a program or course? (Put appropriate number in each box)

1. ABLE TO REVIEW THE SYLLABI (Description of course/ program, instructor's credentials, etc.)
2. COST TO SUBSCRIBE
3. LEAD TIME IN LEARNING ABOUT THE UPCOMING OFFERING

[ ] MOST CRITICAL FACTOR

4. LENGTH OF THE PROGRAM SESSIONS (hours)
5. TIME OF DAY OFFERED
6. DAY(S) OF THE WEEK OFFERED

[ ] SECOND MOST CRITICAL FACTOR

7. TIME OF THE YEAR OFFERED
8. APPROVAL FROM SUPERVISOR
9. VALUE OF INFORMATION IN MY PERSONAL LIFE

[ ] THIRD MOST CRITICAL FACTOR

10. VALUE OF THE INFORMATION TO MY BUSINESS/CAREER
11. NUMBER OF CREDITS OFFERED
12. ASSURANCE ANNOUNCED COURSE WILL BE TAUGHT
13. TECHNOLOGY REQUIREMENTS
14. QUALITY OF THE ORGANIZATION/INSTITUTION PROVIDING THE OFFEREING
15. TAUGHT BY A NATIONALLY RECOGNIZED MASTER TEACHER
16. LOCATION
17. OTHER (Please specify: _____)

D. The ideal length of an individual program or course session is _____ ? (Circle number)

1. ONE HOUR OR LESS
2. 2 HOURS
3. 3 HOURS
4. 4 HOURS
5. ALL DAY

E. When you become aware of an upcoming program or course, how long would it take to decide to subscribe to the program or course? (Circle number)

1   LESS THAN A WEEK.
2   1-2 WEEKS
3   ONE MONTH
4   1 - 2 MONTHS
5   2 - 6 MONTHS
6   6 - 12 MONTHS
7   LONGER THAN A YEAR

F. What is the most, second, and third most important features that you would desire in an educational program? (Put appropriate number in each box)

☐ MOST CRITICAL FACTOR	1 INFORMATION PROVIDED IS THE MOST CURRENT RESEARCH RESULTS
	2 INFORMATION IS PROVIDED BEFORE I NEED IT.
	3 INFORMATION IS UNBIASED
☐ SECOND MOST CRITICAL FACTOR	4 INFORMATION IS PROVIDED IN A FORM I CAN USE
	5 PROGRAM IS OFFERED IN THE EVENINGS
	6 PROGRAM IS OFFERED ON THE WEEKENDS
☐ THIRD MOST CRITICAL FACTOR	7 PROGRAM OFFERED DURING REGULAR BUSINESS HRS.
	8 PROGRAM IS OFFERED DURING THE WINTER MONTHS
	9 PROGRAM/ASSIGNMENTS ARE INDIVIDUALIZED TO MEET MY NEEDS

10 PROGRAM HELPS ME EARN A UNIVERSITY DEGREE
11 PROGRAM IS AFFORDABLE
12 OTHER (Please specify:_____)

G. If resources suddenly became more limited, would you_____? (Circle number)

1   STILL SUBSCRIBE TO THE PROGRAM OR COURSE
2   PROBABLY NOT SUBSCRIBE
3   DEFINITELY NOT SUBSCRIBE

H. Have you ever enrolled in a college-credit course that was taught at a distance? (Circle number)

1   YES
2   NO

I. I believe that university courses taught by **satellite** (where I can see and hear the instructor and the instructor can only hear me) are of the_____quality as on-campus courses. (Circle number that indicates your answer for the blank space)

1   SAME OR EQUAL
2   BETTER
3   LESSER

J. I believe that university courses taught by **compressed video** (where I can see and hear the instructor and the instructor can also see and hear me) are of the_____quality as on-campus courses. (Circle number)

1   SAME OR EQUAL
2   BETTER
3   LESSER

K. I believe that university courses taught by **videotape** (where I can see and hear the instructor) are of the_____quality as on-campus courses.

   1   SAME OR EQUAL
   2   BETTER
   3   LESSER

L. I am interested in obtaining the following degree? (Circle number)

   1   BACHELOR'S DEGREE
   2   MASTER'S DEGREE
   3   DOCTORATE
   4   I AM NOT INTERESTED IN OBTAINING A DEGREE AT THIS TIME

M. I am aware that Iowa State University offers a Bachelor's and a Master's degree in agriculture that is available through distance education. (Circle number)

   1   YES, I WAS AWARE OF THE DEGREE PROGRAMS
   2   NO, I WAS NOT AWARE OF THE DEGREE PROGRAMS

N. Please indicate the extent of your past use and future desires in continuing or extended education opportunities. In the table below, select the best answer in Column A and Column B for each item. (Circle the number to indicate your response)

Educational Opportunities	Column A Extent of use in the last 3 years				Column B Desire to use during the next 5 years					
	Much	Some	None	Uncertain	Much More	More	Same	Less	Much Less	No Opinion
• Subscribe to professional development programs and/or courses tailored exclusively to my interest/business	1	2	3	9	1	2	3	4	5	9
• Subscribe to professional development programs and/or courses that would interest several individuals or firms/associations	1	2	3	9	1	2	3	4	5	9
• Participate in conferences, seminars, and/or meetings tailored exclusively to my interest/business	1	2	3	9	1	2	3	4	5	9
• Participate in conferences, seminars, and/or meetings that would interest several individuals or firms/associations	1	2	3	9	1	2	3	4	5	9
• Participate in programs, short courses, and/or workshops tailored exclusively to my interest/business	1	2	3	9	1	2	3	4	5	9
• Participate in programs, short courses, and/or workshops that would interest several individuals or firms/associations	1	2	3	9	1	2	3	4	5	9
• Participate in a program resulting in a license	1	2	3	9	1	2	3	4	5	9
• Participate in a certificate program	1	2	3	9	1	2	3	4	5	9
• Participate in a contemporary issues oriented special program	1	2	3	9	1	2	3	4	5	9
• Pay a "per use" fee to access credit courses in: - agricultural subjects	1	2	3	9	1	2	3	4	5	9
- personal or organizational development topics	1	2	3	9	1	2	3	4	5	9
- graduate degree programs	1	2	3	9	1	2	3	4	5	9
• Have a formal education/training affiliation with a university	1	2	3	9	1	2	3	4	5	9

II. INFORMATION SOURCES

This section of the questionnaire is designed to collect information related to where and how you gain your information for use in your business and personal life.

A. Think back to the last time you needed to get information to solve a problem or make a change in your business/operation. Which of the categories listed below would **best** describe the reason for seeking information. (Circle ONLY ONE number to indicate your answer)

1   GETTING A NEW IDEA, METHOD, OR PRODUCT FOR THE FARM, BUSINESS, OR HOME

2   GETTING DETAILED INFORMATION ABOUT A NEW IDEA AND THE POSSIBILITY OF USING IT ON MY FARM, BUSINESS, OR PERSONAL LIFE

3   GETTING NECESSARY INFORMATION TO EVALUATE THE NEW IDEA AND MAKING COMPARISONS BETWEEN IT AND THE OLD ONE

4   GETTING NECESSARY INFORMATION ON HOW TO TRY A NEW IDEA ON A TRIAL RUN BASIS

5   GETTING NECESSARY INFORMATION TO ADOPT AND USE A NEW IDEA ON A LARGE SCALE BASIS

6   GETTING INFORMATION TO SOLVE A NEW PROBLEM

7   GETTING INFORMATION TO SOLVE A RECURRING PROBLEM

8   OTHER (PLEASE SPECIFY: _____)

B. What is the most, second, and third most sought types of information are you typically seeking? (Put appropriate number in each box)

☐ **MOST CRITICAL FACTOR**	1. GENERAL AGRICULTURE NEWS 2. GRAIN AND LIVESTOCK MARKET INFORMATION 3. NATIONAL NEWS 4. INTERNATIONAL NEWS
☐ **SECOND MOST CRITICAL FACTOR**	5. FARM RECORDS ANALYSIS 6. HOW-TO TECHNIQUES 7. TIME/LABOR SAVING TECHNIQUES
☐ **THIRD MOST CRITICAL FACTOR**	8. TRENDS 9. WEATHER 10. CONSERVATION 11. SAFETY 12. HORTICULTURE AND HOME GARDENING 12. OTHER (Specify:_____)

C. Several sources of information, such as magazines, workshops, and private consultants, assess a "subscription" fee before you can receive the information. If an information source could meet nearly all your needs, what could you pay to subscribe to the information source and what would you pay to subscribe to the information source? Select the best answer in Column A and Column B for each item by placing an "X" in the appropriate box.

Subscription Cost	Column A Maximum fee can pay to subscribe	Column B Maximum fee will pay to subscribe
$ 0.		
100.		
500.		
1,000.		
Fee would not be a concern		

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D. Within the last 12 months, how often have you used the following methods to obtain information related to your job/business?. (Place an "X" in the frequency box that correctly corresponds for each type of information source)

Information Source	NEVER	ONCE	TWICE	3 TIMES	4+ TIMES
• Read articles in magazines or trade journals					
• Read articles in newspapers					
• Read books or manuals					
• Read catalog, brochures, flyers and/or pamphlets					
• Written for information					
• Telephoned for information					
• Visited a dealer					
• Attended an exhibit at a fair or expo					
• Attended tours & demonstrations					
• Attended a field day or conference					
• Taken a course					
• Self study (via library and other reference sources)					
• Attended an Extension workshop					
• Contacted or visited Extension office					
• Read Extension newsletters					
• Read Extension bulletins					
• Read newsletters, journals from Professional organizations					
• Used a private consulting service (fee paid)					
• Used a private consulting service (free)					
• Listened to radio program or audio tape					
• Listened to audio tape					
• Viewed videotape					
• Viewed public tv program (free)					
• Viewed cable tv program (fee paid)					
• Participated in teleconference (voice only)					
• Participated in video conference					
• Viewed satellite program					
• Used Internet or other electronic data sources					
• Personal contacts					
• Other (specify)					

E. Where do you learn about upcoming educational events or programs. What would be the best information source for us to use to let you know about an upcoming educational events or programs?

DIRECTIONS: Using the above table, circle the name of the source in the left-hand column that would be best to use in informing you of an upcoming education opportunity . (Circle the ONE name in the above table that represents the best source)

III. EDUCATIONAL TECHNOLOGY USE

New electronic technologies have increased the possibilities by which a university can share its educational and informational resources. This section of the questionnaire seeks to understand your personal preferences towards using these new technologies and potential barriers that could prevent your participation.

A. There is a class offered by your state's university that you have always wished to take but it was too far to drive. Through new electronic technologies, the class is being offered at several sites around your state, one of which is your local high school. This new technology is an interactive delivery system that allows you to see and hear the instructor (who is at the university) and for the instructor to see and hear you. Other students at other sites will also be able to see and hear you.

DIRECTIONS: Please indicate if any of the items below would present a problem or inconvenience for you in attending the class described above. Us ing the 4-point scale provided below, indicate your personal difficulty with each item by circling the appropriate number.

	Not A Problem	Problem But Not Difficult	Moderately Difficult Problem	Very Difficult Problem
• Lack of time for class .	1	2	3	4
• Still too far to drive	1	2	3	4
• Being watched by video camera	1	2	3	4
• Communicating by microphone	1	2	3	4
• Costs too much	1	2	3	4
• The interactive technology itself	1	2	3	4
• Nobody else in classroom with me	1	2	3	4
• Instructor is miles away	1	2	3	4

B. Distance education systems have differing forms of interaction possible; both with the course instructor and with the other enrolled students. Using the table below, indicate which types of interaction levels you feel you **MUST HAVE** to realize a positive and successful learning experience.

DIRECTIONS: Please check either "YES" or "NO" for each form of interaction. NOTE: *Answering "NO" to every interaction form would indicate that you would not need interaction with the instructor or others to realize a positive and successful learning experience.*

Interaction Formats	YES	NO
• Can see and hear instructor and other students and they can see and hear me		
• Can see and hear instructor but he/she can only hear me		
• Can see and hear instructor but he/she cannot see or hear me		
• With instructor via fax machine (outside of course hours)		
• With instructor via telephone (outside of course hours)		
• With instructor via computer-based electronic mail (outside of course hours)		
• With instructor via regular mail (outside of course hours)		
• Face-to-face with the instructor on a regular basis		
• Face-to-face with the instructor at least once during the course		
• With other students via fax machine (outside of course hours)		
• With other students via telephone (outside of course hours)		
• With other students via computer-based electronic mail (outside of course hours)		
• With other students via regular mail (outside of course hours)		
• Face-to-face with other students on a regular basis		
• Face-to-face with other students at least once during the course		
• OTHER (Please specify)		

C. To further understand your learning styles and preferences, listed below are several statements related to your learning activity patterns and communication preferences. Please indicate your feelings towards each statement by circling the number that correctly corresponds.

Communication Preferences	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
• I am basically an outgoing person.	1	2	3	4	5	6
• I am afraid to express myself in a group.	1	2	3	4	5	6
• I talk less because I am shy.	1	2	3	4	5	6
• I enjoy responding to questions at a meeting.	1	2	3	4	5	6
• Attendance at educational programs generally infringes upon my family time.	1	2	3	4	5	6
• I tend to feel guilty when away from home or family for an educational activity.	1	2	3	4	5	6
• My family/spouse objects to my outside activities.	1	2	3	4	5	6
• With all my other commitments, I just don't have the time to attend educational activities.	1	2	3	4	5	6
• It is often difficult to arrange for child care so I can attend an educational activities.	1	2	3	4	5	6

D. To understand your attitude towards using computer-based educational technologies, listed below are several statements regarding your use of computers. Please indicate your feelings towards each statement by circling the number that correctly corresponds.

Computer-based Technologies	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
• I feel I can learn to use the computer in more ways than I currently use it.	1	2	3	4	5	6
• Working on a computer makes me nervous.	1	2	3	4	5	6
• Computers will make it easier to get information I need when I need it.	1	2	3	4	5	6
• Computers do not scare me at all.	1	2	3	4	5	6
• I'm afraid that if I don't use computers, I'll be passed-by by others.	1	2	3	4	5	6
• I want to learn more about using computers.	1	2	3	4	5	6
• I would have a computer now, but they are too difficult to operate.	1	2	3	4	5	6
• I use a computer on a daily basis.	1	2	3	4	5	6
• I feel aggressive and hostile towards computers.	1	2	3	4	5	6
• I cannot afford to purchase a computer.	1	2	3	4	5	6
• I have easy access to a computer.	1	2	3	4	5	6
• Using a computer would conflict with my other job responsibilities.	1	2	3	4	5	6
• I feel confident in operating a computer.	1	2	3	4	5	6
• I don't have time to use a computer.	1	2	3	4	5	6
• I am willing to learn to use the Internet and other information on-line services.	1	2	3	4	5	6
• Everyone should have access to the Internet and other information on-line services.	1	2	3	4	5	6
• Computers are changing so fast that when I become proficient with one, it will soon be out-of-date.	1	2	3	4	5	6
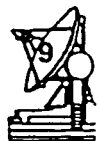
E. To understand your attitudes towards using video-based educational technologies, listed below are several statements regarding use of video-based technologies. Please indicate your feelings towards each statement by circling the number that correctly corresponds.

To assist your responding, the video-based educational technologies were divided into two groups: storage (including videotape, laser disk, and CD-ROM) and broadcast (including public TV broadcasts, microwave, cable/satellite broadcasts, and fiber optic/compressed video transmissions).

Video STORAGE Technologies	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
• I am willing to learn to use new video storage technologies.	1	2	3	4	5	6
• Training should be provided to better use video storage technologies.	1	2	3	4	5	6
• I feel I can learn to use video storage technologies in more ways than I currently use it.	1	2	3	4	5	6
• Video storage technology is changing so fast that I feel that when I become proficient with one, it will soon be out-of-date.	1	2	3	4	5	6
• Working with video storage technologies makes me nervous.	1	2	3	4	5	6
• I use video storage technology on a daily basis.	1	2	3	4	5	6
• I would have video storage technology now, by they are too difficult to operate.	1	2	3	4	5	6
• I feel aggressive and hostile towards video storage technologies.	1	2	3	4	5	6
• I have easy access to video storage technologies.	1	2	3	4	5	6
• I cannot afford to purchase video storage technology.	1	2	3	4	5	6
• I feel confident in operating video storage tech.	1	2	3	4	5	6
• I can learn new techniques by using video storage technology.	1	2	3	4	5	6

Video BROADCAST Technologies	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
• I am willing to learn to use new video broadcast technologies.	1	2	3	4	5	6
• Training should be provided to better use video broadcast technologies.	1	2	3	4	5	6
• I feel I can learn to use video broadcast technology in more ways than I currently use it.	1	2	3	4	5	6
• Video broadcast technology is changing so fast that I feel that when I become proficient with one, it will soon be out-of-date.	1	2	3	4	5	6
• I am satisfied with my current knowledge of video broadcast technologies.	1	2	3	4	5	6
• Working with video broadcast technologies makes me nervous.	1	2	3	4	5	6
• I use broadcast technology on a daily basis.	1	2	3	4	5	6
• I would have video broadcast technology now, by they are too difficult to operate.	1	2	3	4	5	6
• I feel aggressive and hostile towards video broadcast technologies.	1	2	3	4	5	6
• I have easy access to broadcast technologies.	1	2	3	4	5	6
• I cannot afford to purchase video broadcast technology (dishes, CODEC, etc.).	1	2	3	4	5	6
• I feel confident in operating video broadcast tech.	1	2	3	4	5	6
• I can learn new job-specific techniques by using video broadcast technology.	1	2	3	4	5	6
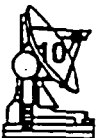
IV. PERCEPTIONS OF IOWA STATE UNIVERSITY AND THE COLLEGE OF AGRICULTURE

A. I am aware of Iowa State University's existence. (Circle number of your answer)
1   YES
2   NO (if NO, skip to Section V on page 12.)

B. I am aware of Iowa State University is a land-grant institution. (Circle number)
1   YES
2   NO
3   UNCERTAIN OF WHAT IS A LAND-GRANT INSTITUTION

C. I believe that Iowa State University is a _____ quality university. (Circle number)
1   HIGH
2   AVERAGE
3   LOWER
4   UNCERTAIN AS TO QUALITY LEVEL

D. Iowa State University is best known for its _____ . (Circle number)
1   TEACHING
2   RESEARCH
3   EXTENSION SERVICES
4   OTHER OUTREACH ACTIVITIES
5   FACULTY AND STAFF
6   FACILITIES
7   STUDENT SUPPORT SERVICES
8   ATHLETICS
9   QUALITY OF ITS GRADUATES

E. I am aware that Iowa State University has a college of agriculture. (Circle number)
1   YES
2   NO

F. I believe that Iowa State University's College of Agriculture is of _____ quality. (Circle number)
1   HIGH
2   AVERAGE
3   LOWER
4   UNCERTAIN AS TO QUALITY LEVEL

G. Iowa State University's College of Agriculture is best known for its _____ . (Circle number)
1   TEACHING
2   RESEARCH
3   EXTENSION SERVICES
4   OTHER OUTREACH ACTIVITIES
5   FACULTY AND STAFF
6   FACILITIES
7   STUDENT SUPPORT SERVICES
8   JUDGING TEAMS
9   QUALITY OF ITS GRADUATES

V. ISSUES AND PROBLEMS IN AGRICULTURE

Every organization and individual addresses a variety of issues and problems that impact the ways and means by which they will conduct their daily activities. In this questionnaire, *issues* are defined as *a point of question that is in dispute by two or more sides.* **Problems** are defined as *an agreed-upon question with its solution being unknown.*

A. What is the most, second, and third critical issue impacting agriculture? (Put appropriate number in each box)

☐ MOST CRITICAL ISSUE

☐ SECOND MOST CRITICAL ISSUE

☐ THIRD MOST CRITICAL ISSUE

1. INTERNATIONAL TRADE POLICIES (GATT, NAFTA)
2. USE OF BIOTECHNOLOGY ADVANCES
3. AGRICULTURE'S RELATIONSHIP WITH THE ENVIRONMENT
4. FOOD ACCESSIBILITY
5. LEVEL OF FARM SUBSIDIES
6. LEVEL OF GOVERNMENT REGULATIONS
7. PROPERTY RIGHTS/UTILIZATION
8. WHAT IS THE BEST USE OF NATURAL RESOURCES
9. OTHER (Please specify:_____)

B. What is the most, second, and third critical problem facing agriculture? (Put appropriate number in each box)

☐ MOST CRITICAL PROBLEM

☐ SECOND MOST CRITICAL PROBLEM

☐ THIRD MOST CRITICAL PROBLEM

1. DEPRESSED PRICES FOR AGRICULTURE PRODUCTS
2. AGRICULTURE WASTE MANAGEMENT
3. PUBLIC'S UNDERSTANDING OF AGRICULTURE
4. DIFFICULTY FOR YOUNG PEOPLE/COUPLES TO START FARMING
5. SHORTAGE OF QUALIFIED EMPLOYEES FOR AGRICULTURE POSITIONS
6. IMPROVING FOOD SAFETY
7. IMPROVING NUTRITIONAL VALUE OF FOOD PRODUCTS
8. DECLINE IN FARM NUMBERS
9. DECLINE IN FAMILY FARM STRUCTURE
10. OTHER (Please specify: _____)

VI. DEMOGRAPHICS

A. Your gender.   (Circle number of your answer)
    1   MALE
    2   FEMALE

B. Your present marital status.   (Circle number)
    1   NEVER MARRIED
    2   MARRIED
    3   DIVORCED
    4   SEPARATED
    5   WIDOWED

C. Number of children you have in each age group.   (if none, write "0")
    Number of children
        _____ UNDER 5 YEARS OF AGE
        _____ 5 TO 13
        _____ 14 TO 18
        _____ 19 TO 24
        _____ 25 AND OVER

D. Your present age:_____ YEARS

E. Your ethnic background   (Circle number)
    1   AFRICAN-AMERICAN
    2   ASIAN-AMERICAN/PACIFIC ISLANDER
    3   HISPANIC
    4   NATIVE AMERICAN
    5   WHITE, NON-HISPANIC
    6   OTHER (Please specify: _____)

F. Are you presently . . .   (Circle number)
    1   EMPLOYED
    2   RETIRED/DISABLED
    3   HOMEMAKER
    4   STUDENT
    5   TEMPORARILY UNEMPLOYED (If temporarily unemployed, skip to Question H)

G. Your current primary occupation.   (Circle ONE number)
    1   PRODUCTION AGRICULTURE
    2   AGRIBUSINESS
    3   BUSINESS—NOT AGRICULTURE RELATED
    4   GOVERNMENT SERVICE AGENCY (SCS, ASCS, etc.)
    5   PUBLIC EDUCATION (high school, Extension, university, etc.)
    6   COUNTY/STATE GOVERNMENT
    7   COMMUNICATIONS/JOURNALISM
    8   OTHER (please state:_____)

H. Which of the following categories best describes where you live.   (Circle number)

   1 CITY OF 100,000+

   2 SUBURB OF A CITY

   3 TOWN OF 50,000-100,000

   4 TOWN OF 10,000-50,000

   5 TOWN OF 5,000-10,000

   6 TOWN OF 1,000-5,000

   7 TOWN OF LESS THAN 1,000

   8 RURAL AREA

I. Which is the highest level of education that you have completed.   (Circle number)

   1 LESS THAN HIGH SCHOOL

   2 COMPLETED HIGH SCHOOL (Diploma or equivalency)

   3 SOME COLLEGE

   4 COMPLETED ASSOCIATE, TWO-YEAR, JUNIOR COLLEGE DEGREE

   5 COMPLETED BACHELOR'S DEGREE   (specify major)_____

   6 SOME GRADUATE WORK

   7 COMPLETED MASTER'S DEGREE   (specify major)_____

   8 COMPLETED DOCTORAL'S DEGREE   (specify major)_____

   9 COMPLETED PROFESSIONAL DEGREE (MD, DVM, etc.)

      (specify degree)_____

  10 OTHER (specify)_____

J. What percentage of your family's total net income came from farming or other production of raw agriculture products (such as a greenhouse, fisheries, etc.) in 1994. (Circle number)

   1 25% OR LESS

   2 26% - 50%

   3 51% - 75%

   4 76% - 99%

   5 100%

   6 NONE (If "NONE," proceeed to the end of the questionnaire)

K. Do you have a job in addition to farming or producing raw agriculture products? (Circle number)

   1 NO—FULL-TIME FARMING

   2 YES—PART-TIME JOB OF 20 HOURS A WEEK OR LESS

   3 YES—PART-TIME JOB OF 21-39 HOURS A WEEK

   4 YES—FULL-TIME JOB OF 40 HOURS A WEEK OR MORE

L. How many years have you farmed since age 18? _____ YEARS

M. What is the tenure relationship of your land farmed   (Circle number)

   1 RENT ALL LAND

   2 OWN ALL LAND

   3 OWN SOME LAND AND RENT SOME

   4 FARM/BUSINESS MANAGER—NEITHER OWNED NOR RENTED LAND

N. How many acres did you farm in 1994 (owned & rented)?   (Circle number)
   1   LESS THAN 200 ACRES
   2   200-399 ACRES
   3   400-599 ACRES
   4   600-799 ACRES
   5   800-999 ACRES
   6   1,000 ACRES OR MORE

O. What was your major type of production area in 1994?   (Circle number)
   1   GRAIN CROP
   2   LIVESTOCK/POULTRY
   3   SPECIALTY CROP—OTHER THAN GRAIN
   4   COMBINATION (Please describe: _____)

Please return completed survey questionnaire in the enclosed envelope by January 13, 1995

THANK YOU
FOR YOUR
ASSISTANCE

APPENDIX H. HUMAN SUBJECTS COMMITTEE APPROVAL

Information for Review of Research Involving Human Subjects
Iowa State University
(Please type and use the attached instructions for completing this form)

1. Title of Project Distance Education in Agriculture: Understanding Your Educational and Informational Needs

2. I agree to provide the proper surveillance of this project to insure that the rights and welfare of the human subjects are protected. I will report any adverse reactions to the committee. Additions to or changes in research procedures after the project has been approved will be submitted to the committee for review. I agree   project continuing more than one year.

David L. Doerfert   12/20/94
Typed Name of Principal Investigator   Date   Sign

Agricultural Education & Studies   217B Curtiss Hall   4-3421
Department   Campus Address   Campus Telephone

3. Signatures of other investigators   Date   Relationship to Principal Investigator

Dawn A. Mellion   12/20/94   Research Assistant

Tom Jorden   12/20/94   Research Assistant

                                         12/20/94   Project Coordinator

4. Principal investigator(s) (check all that apply)
   [X] Faculty   [ ] Staff   [ ] Graduate Student   [ ] Undergraduate Student

5. Project (check all that apply)
   [X] Research   [ ] Thesis or dissertation   [ ] Class project   [ ] Independent Study (490, 590, Honors project)

6. Number of subjects (complete all that apply)
   3100 # Adults, non-students   ___ # ISU student   ___ # minors under 14   ___ other (explain)
                                                         ___ # minors 14 - 17

7. Brief description of proposed research involving human subjects: (See instructions, Item 7. Use an additional page if needed.)
   Project is a market analysis for distance education programming in agriculture. 3,100 participants will be involved in the study. Participants are randomly selected from professional membership databases of selected agriculture-oriented organizations, primarily in Iowa and the bordering states. Participation is voluntary. Data will be summarized and analyzed by slected market segments. Final report will guide future distance education programming within the College of Agriculture. Selected participants will receive a cover letter and questionnaire in January. Two follow-up postcards, a second mailing, and a reminder telephone call will be used to increase response rate.

(Please do not send research, thesis, or dissertation proposals.)

8. Informed Consent: [ ] Signed informed consent will be obtained. (Attach a copy of your form.)
                          [ ] Modified informed consent will be obtained. (See instructions, item 8.)
                          [X] Not applicable to this project.

9. Confidentiality of Data: Describe below the methods to be used to ensure the confidentiality of data obtained. (See instructions, item 9.)

All questionnaires will be coded to handling response and follow-up mailings. Upon completion of data entry and analysis, all questionnaires will be destroyed. Coding will be known only to the principal investigator and his assistants. No names will appear in any research reports or articles.

10. What risks or discomfort will be part of the study? Will subjects in the research be placed at risk or incur discomfort? Describe any risks to the subjects and precautions that will be taken to minimize them. (The concept of risk goes beyond physical risk and includes risks to subjects' dignity and self-respect as well as psychological or emotional risk. See instructions, item 10.)

None known to the principal investigator.

11. CHECK ALL of the following that apply to your research:
   ☐ A. Medical clearance necessary before subjects can participate
   ☐ B. Samples (Blood, tissue, etc.) from subjects
   ☐ C. Administration of substances (foods, drugs, etc.) to subjects
   ☐ D. Physical exercise or conditioning for subjects
   ☐ E. Deception of subjects
   ☐ F. Subjects under 14 years of age and/or   ☐ Subjects 14 - 17 years of age
   ☐ G. Subjects in institutions (nursing homes, prisons, etc.)
   ☐ H. Research must be approved by another institution or agency (Attach letters of approval)

If you checked any of the items in 11, please complete the following in the space below (include any attachments):

Items A - D   Describe the procedures and note the safety precautions being taken.

Item E   Describe how subjects will be deceived; justify the deception; indicate the debriefing procedure, including the timing and information to be presented to subjects.

Item F   For subjects under the age of 14, indicate how informed consent from parents or legally authorized representatives as well as from subjects will be obtained.

Items G & H   Specify the agency or institution that must approve the project. If subjects in any outside agency or institution are involved, approval must be obtained prior to beginning the research, and the letter of approval should be filed.

Checklist for Attachments and Time Schedule

The following are attached (please check):

12. [X] Letter or written statement to subjects indicating clearly: included in instrument
    a) purpose of the research
    b) the use of any identifier codes (names, #'s), how they will be used, and when they will be removed (see Item 17)
    c) an estimate of time needed for participation in the research and the place
    d) if applicable, location of the research activity
    e) how you will ensure confidentiality
    f) in a longitudinal study, note when and how you will contact subjects later
    g) participation is voluntary; nonparticipation will not affect evaluations of the subject

13. [ ] Consent form (if applicable)

14. [ ] Letter of approval for research from cooperating organizations or institutions (if applicable)

15. [X] Data-gathering instruments

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16. Anticipated dates for contact with subjects:
    First Contact   Last Contact

    January 6, 1995   February 15, 1995
    _____   _____
    Month / Day / Year   Month / Day / Year

17. If applicable: anticipated date that identifiers will be removed from completed survey instruments and/or audio or visual tapes will be erased:

    July 1, 1995 (at the latest)
    _____
    Month / Day / Year

18. Signature of Departmental Executive Officer   Date   Department or Administrative Unit

                                                    12-21-94   Cy Ed S

19. Decision of the University Human Subjects Review Committee:

    X Project Approved   ___ Project Not Approved   ___ No Action Required

    Patricia M. Keith   11 5 95
    _____   _____   _____
    Name of Committee Chairperson   Date   Signature of Committee Chairperson

GC:1/90

APPENDIX I. CORRESPONDENCE WITH FOCUS GROUP PARTICIPANTS

IOWA STATE UNIVERSITY 146
OF SCIENCE AND TECHNOLOGY

Department of Agricultural Education and Studies
201 Curtiss Hall
Ames, Iowa 50011-1050
Administration and Graduate Programs 515 294-5904
Research and Extension Programs 515 294-5872
Undergraduate Programs 515 294-6924

November 10, 1994

Dear

The intention of this letter is to invite you or a fellow colleague to a focus group meeting concerning distant education at Iowa State University. The meeting will be held at the North End Diner restaurant in Johnston (on Merle Hay Road north of I-35) on November 16, 1994 starting at 12:00 noon. Lunch will be provided.

The discussion will focus on Iowa State University's Agricultural Distant Education Program. Currently, ISU's College of Agriculture is evaluating the distant education program and recently have been speaking with the several disciplines in agriculture. During this focus group session we will be discussing the opportunities and challenges of learning conservation and/or environmental education at a distance and we would like to get your input on this matter. This is strictly a research project of the College of Agriculture, and no sales or solicitations will be made. Because of your donation of time, at the conclusion of the session we will be giving you a token of our appreciation.

If you are not able to attend, please call us to let us know as soon as possible. Our telephone number is (515) 294-5872.

We look forward to seeing you on November 16.

Sincerely,

Tom Jordan
Research Assistant

Dr. David L. Doerfert
Coordinator of I.S.U.'s Professional
Agriculture Programs

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

Department of Agricultural Education and Studies
201 Curtiss Hall
Ames, Iowa 50011-1050
Administration and Graduate Programs 515 294-5904
Research and Extension Programs 515 294-5872
Undergraduate Programs 515 294-6924

November 17, 1994

Dear

Iowa State University's College of Agriculture sincerely appreciates the time you took in attending the focus group discussion.

Educating those involved in Agriculture (indirectly or directly) is very important at ISU and the Distant Education program is a tremendous tool in accomplishing this. Your comments and feedback expressed during the focus group will definitely qualify and improve distant education at ISU.

Again, thanks so much for your time and thoughts.

Sincerely,

Tom Jordan
Research Assistant

Dr. David L. Doerfert
Coordinator of I.S.U.'s Professional
Agriculture Programs