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EDUCATIONAL OPPORTUNITIES FOR AGRICULTURAL DISTANCE PROGRAMS

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Abstract

The study was guided by the following research objectives: (a) determine the demographics of agricultural Career and Technical Education (CTE) educators, (b) determine the demand for distance delivered educational alternatives among agricultural CTE educators, (c) determine the topic or subject areas most desired by agricultural CTE educators wanting distance delivered educational opportunities, (d) evaluate the influence of cost in the demand for distance delivered educational alternatives, and (e) determine the preferred method of distance delivery for additional education or training opportunities by agricultural CTE educators. The population for this study was agricultural CTE educators who were employed in Washington State public and private secondary schools attending the annual summer conference. The study included 249 of the 318 potential respondents. One-hundred ninety five usable surveys were completed for a response rate of 77.5 percent. Data were summarized by mean scores, frequencies, and percentages. The researchers concluded that agricultural CTE educators desired additional distance delivered education or training for personal and professional growth and that it should be available to them in their home area through the use of distance education. Distance education delivery methods to be utilized for this additional education and training were short courses, seminars, and conferences. The topic areas most desired were agriculture technology, plant and animal sciences, and educational technology. In addition, cost was determined to be an obstacle for agricultural CTE educators who desired additional education or training.

Introduction

Agricultural CTE educators in Washington State are among the most isolated professionals in our region. As a result, research and educational opportunities have been limited and little has been done to improve educational opportunities. Washington State University has no research and education center for professional CTE educators in the state or region. Yet, agriculture is the economic base for many communities in this area as well as being important in maintaining economically viable communities (Washington Agricultural Statistics Service, 1998). In addition, the opportunity for residents to further their educational goals is as important as improving the human capital in these communities.

The use of technology has made it possible to provide an increasing variety of distance educational opportunities for those who may not be able to attend a university in person. "Communications technologies have the potential to increase course access to homebound students as well as those who, for reasons such as careers and other responsibilities, are unable to access residential programs" (Nti & Bowen, 1998). People desiring a university degree or needing to add to their current educational training are increasingly able to access the classes they need via existing communication technology available in their own communities, provided a suitable

location is available to receive the classes. This is especially important for all CTE educators who need 150 clock hours of continued educational study or the equivalent academic credit every 5 years to maintain their teacher certification in the state (Office of Superintendent of Public Instruction, 2000).

Many universities have geared up to provide "distance learning" alternatives to residents within their states and/or regions. Sherry (1995) in her "*Issues in Distance Learning*" defines distance education as situations where the instructor and students are in separate locations or times, where greater volitional control of learning is held by the learner rather than the instructor and communications are mediated between teacher and student by print or technology. Because of distance education, education is now available for students who once were unreachable (Truman, 1995).

> The shift from the perception that distance education serves the student stranded in the backwoods or desert is making room for the student just down the street with a harried schedule, family or social commitments, illness, disability or learning preference (Truman, 1995, ¶ 3).

The development and use of communications technologies and instructional systems currently taking place are certain to bring about change in education (Murphy & Terry, 1998). In most cases, expensive equipment and other educational resources are being expanded with little or no research data as to the demand for these services by the general public or targeted professionals. Not only is there little research data as the general demand for these types of learning alternatives, there is less information as to the types of "classes" that the public would utilize. This is especially true in the agricultural CTE education profession in Washington State.

Limited research is available regarding documented in-service needs of agricultural CTE educators. Many times secondary educators are not asked about their in-service needs, even though distance education literature cites its importance (Beaudoin, 1990). It is important to document the vital research areas necessary to assist in maintaining healthy growth in professional education segments.

To be effective, distance learning opportunities and documented research must be based on solid knowledge about the public and professional agricultural CTE educators' demand for such services. This baseline quantitative study provides a database indicating where limited resources should be placed to assure positive results.

Theoretical/Literature Base

Education has evolved from the early beginnings of learning when teacher and student met at the same place and time (Moore & Kearsley, 1996). Now students and teachers can be separated by distance and time to achieve education objectives which is known as distance education (Moore & Kearsley). Distance education is defined as

> "planned learning that normally occurs in a different place from teaching and as a result requires special techniques of course design, special instructional techniques, special methods of communication by electronic and other technology, as well as special organizational and administrational arrangements" (Moore & Kearsley, p. 2).

Distance education has taken a long road to where it is today. Correspondence education, which is the earliest form of distance education, can be traced back to the early 1700s (Jeffries, 2000). However, the uses of technology-based distance education, such as audiovisual devices, were adapted in the early 1900s. The first forms of technology-based distance education were instructional films, with the first catalog for these films appearing in 1910 and 1913 (Reiser, 1987). By the 1920s slides and motion pictures were being used in many of the extension programs similar to how they were used in the classroom (Jeffries).

In the 1920s and 1930s broadcast technologies, with the help of the radio, began to develop new forms of distance

education (Holmberg, 1996). In 1932, State University of Iowa, through the use of instructional television, "began experimenting with transmitting instructional courses" (Jeffries, 2000). World War II slowed the introduction of television, but the use of teaching with audio-visual media was evolving because of the efforts by the military (Wright, 1991). Even though there was an increase in new research and projects for instructional television, it was not found to be as effective in distance delivery as print (Holmberg).

During the 1960s and 1970s, additional research and projects began a "new era for distance education" (Bunker, 2000). The development of microwave communication technologies decreased costs for universities, allowing them to use this technology and utilize the Instructional Television Fixed Service (ITFS) (Jeffries, 2000). The ITFS is a twenty-two-channel microwave system that delivers education, training, and cultural information supported by the Federal Communication Commission. However, the relative short range and closed system of ITFS made it impossible for many individuals to access educational opportunities.

The developments that took place in the 1980s and 1990s solved the access problems that distance education faced. The increased development of fiber optics, cable television, satellites, and microcomputer networking (Internet and email) now allows for a teacher to be in one place while the students are in another. This allows students and teachers to interact in live time with immediate feedback to students and allows students to share resources among each other while increasing the educational opportunities for all individuals (Bunker, 2000). The adoption of this cutting-edge technology enables universities to implement distance education to reach more diverse populations and provide learning environments 24 hours a day, 7 days a week (Hara & Kling, 2000).

Now that distance education is available, it can meet the needs of students who have less time and more responsibilities than ever (Akin, Giles, & McCoy, 2000). Students are free to take a variety of courses from different locations, when they have the time and at their own pace (Moore & Kearsley, 1996). Nti and Bowen (1998) observed that graduates are mostly interested in obtaining advanced degrees and improving professional development via distance education. Students and staff now have greater flexibility of delivery systems because of computer-mediated communication, especially because of e-mail (Lindsay & Smith, 1996). Lindsay and Smith state that e-mail is beneficial because it does not require that the student or instructor rely on a fixed place or time; it can be same time correspondence or delayed correspondence. The same-time correspondences, referred to as synchronous education, are learning tools that utilized two-way audio-video conferencing, live Internet feeds (chats and web conferencing) and telephone audio-conferencing. The delayed correspondence applications, known as asynchronous education, are such things as Internet message boards, electronic mail, faxes, and postal correspondence. These wide varieties of delivery methods have increased the educational opportunities for students. However, the University of Idaho Engineering Outreach (2002) did not find a particular technological method that was better than others; they recommended that the educational outcomes and objectives be the underlying support and reason for using a particular delivery method.

Distance education's ability to adapt to many technological delivery methods does allow more students opportunity to gain additional education or training. However, an important goal in determining the objectives for a distance education course is identifying the topics of the course and which type of distance education is most appropriate. Distance education can be adapted to a variety of learners from elementary to high school age students, post-secondary students and/or corporations that need to train their employees. As noted by Bingham, Davis, and Moore (1996), distance education is becoming increasingly popular based on the number of businesses, university, and K-12 programs that have developed or used distance learning in their programs.

Distance education can serve a variety of instructional needs (Anderson, 1996) and specific educational goals. Specialized classes of science, math, and foreign languages are now available to K-12 schools in rural areas that were once unimaginable before distance education (Anderson). According to Barker and Hall (1993), over half the participants from rural school districts strongly supported distance education. Barker (1987) noted that distance education can achieve the following characteristics for rural schools:

- increase educational quality.
- provide access to additional educational opportunities.
- increase student interaction with other students in different schools.
- provide opportunities for staff to further their educational development.
- provide opportunities for in-service training.

The use of distance education in K-12 schools, especially rural districts seem to be limitless.

A study conducted by Nti and Bowen (1998) found that there is a demand for bachelor's level agriculture science courses and that they should be offered at a distance. A program comprised of the University of Idaho, Oregon State University and Washington State University (TADDA, 2000) allows students to obtain a Bachelor of Science degree in Agriculture through the use of distance education without having to move to a nearby university.

Distance education has the ability to be an integral part of secondary and university education programs, however, several issues could affect its success. Gender is a major issue in distance education. Blum (1999) found that males were more dominant online than females, suggesting that males are more adept to the online learning environment. However, females are eliminating the technological barriers with the help of "distance education organizations" (Blum, 1999, p. 60).

The issue of higher cost faces many students that want to utilize the benefits of distance education. In early research, (Eager, 1991; Katz & Jarvis, 1996) cost was a greater concern for women and was found to be a major barrier for women to overcome in using distance education (Strong & Harmon, 1997).

The cost of distance of education is a major issue for most educational institutions (Akin et al., 2000). Akin et al. compared the cost of a class with synchronous delivery and one that was delivered asynchronous. The study concluded that courses conducted asynchronously were substantially lower in cost than the synchronous course. The use of expensive technological equipment, which made the student and teacher able to collaborate at the same time, led to the increase in cost for the synchronous delivery method.

Even though there are issues that inhibit distance education, the future of its success is very positive. "The International Data Corporation (IDC) released a report in January 1999 titled *Online Distance Learning in Higher Education, 1998-2002*. The report estimates that 2.2 million college students will be enrolled in distance education by 2002" (CHEA, 1999, para. 1).

With the continued advancement of technology and increasing number of facilities and resources (Lindsay & Smith, 1996), distance education will certainly grow. As noted by Murphy and Terry (1998): "agriculture educators will be able to deliver programs to broader audiences, including learners of all ages and from diverse backgrounds" (p. 29).

Students will play a major role in the future success of distance education. With the information technology increasing, distance education students will be able to have closer contact with their instructor and fellow classmates (Smith, 1996). Along with the close contact with instructors, they need to be guided and encouraged to find services to help them during their distance education experience (Lindsay & Smith, 1996).

Purpose and Objectives

The purpose of this research was to ascertain the needs of agricultural CTE educators for further educational opportunities, either career development or

personal growth, using distance education. The specific objectives of this research were as follows:

1. determine current demographics of agricultural CTE educators.
2. determine the demand for extended educational alternatives among agricultural CTE educators.
3. determine the topic areas most desired by agricultural CTE educators wanting extended educational opportunities.
4. evaluate the influence of cost in the demand for extended educational alternatives.
5. determine the preferred method of delivery for additional education or training opportunities by agricultural CTE educators.

Methods/Procedures

The research method employed was a descriptive survey. The target population for this baseline quantitative study consisted of agricultural CTE educators (N= 249) that attended the annual Washington State agricultural CTE Summer Conference 2001. A total of 195 usable surveys were completed for a response rate of 77.5%. The current agricultural CTE directory published by the Office of the Superintendent of Public Instruction was used to identify those actually attending the conference for at least one day.

The survey instrument was comprised of 47 singular or multiple questions that were divided into six sections: educational background, occupational and household status, distance education experiences, educational goals, topic areas of interest, personal demographics, and technological status at home and work. Individual response scaling was used for each question on the survey instrument. The survey instrument was adapted from an instrument used by the University of Idaho Social Survey Research Unit (SSRU) with input from a panel of five university experts in distance education. The survey instrument was pilot-tested by twelve agricultural CTE educators in Oregon and Idaho for an established Cronbach's reliability coefficient of .77. Upon return of the surveys, questions were altered to fit the targeted audience of agricultural CTE educators. Items included the state curriculum material, assessment materials, and courses related to a master's degree program.

Results

Demographics of the 195 participants are represented in Figure 1. Seventy-eight percent were male and 22% were female, 30% of the participants were between ages 22 and 35, 64% were between 37 and 51 years of age and 6% of the educators were between 52 and 67 years of age. Four respondents did not report their age. Nineteen percent had a bachelor's degree, 36% had a bachelor's degree and some additional graduate work and 45% had a master's degree.

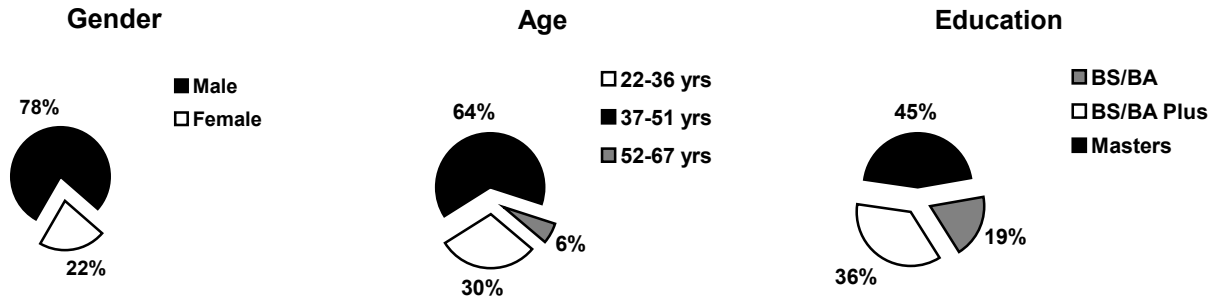

Figure 1. Demographics of Agricultural CTE Educators by Gender, Age and Education

Objective two was designed to determine the demand for extended educational alternatives among agricultural CTE educators. Fifty-five percent of the agricultural CTE educators were very interested in additional education or training (Table 1), 33% were somewhat interested, 3% were somewhat uninterested, 7% were very uninterested and 1% had no answer or were unsure.

Table 1
Interest Level of Agricultural CTE Educators Regarding Additional Education or Training

Interest Level	%
Very interested	55
Somewhat interested	33
Somewhat uninterested	3
Very uninterested	7
No answer/unsure	1
Not reported	1

There were no mean differences found between the agricultural CTE educators age groups of 22 to 26 and 37 to 51 on their interest in obtaining additional education or training. However, there was a difference between the age groups of 22 to 36 (M = 1.52) and 52 to 67 (M = 2.33) as well as for the agricultural CTE educators' age groups 37 to 51 (M = 1.62) and 52 to 67 as reported in Table 2. The mean scores were based on the survey asking participants to answer on a scale of 1 to 3 on whether they wanted additional education or training. A rating of 1 was given by individuals who were somewhat or very interested in additional education or training. A rating of 2 was given by individuals who were very uninterested to somewhat uninterested in additional education or training. A rating of 3 was given by individuals who were unsure or had no answer to obtaining additional education or training.

Table 2
Interest in Additional Training or Education Based on Age.

Age Group	*M*	*SD*	*SE*
22-36	1.53	1.07	.14
37-51	1.62	.82	.07
52-67	2.33	.78	.23

Note. 1 – Very to Somewhat Interested, 2 – Somewhat to Very Uninterested, 3 – No Answer or Not Reported

Objective 3 was used to determine the topic areas most desired by agricultural CTE educators wanting extended educational opportunities (Table 3). The topic areas most desired by agricultural CTE educators reported on the survey instrument were agriculture technology (63%), soil and plant science (61%), animal and veterinary science (60%), and technology usage in education (59%). Additional courses written in by the participants were horticulture, agriculture mechanics, turf management, food science, and administration.

Table 3
Desired Topics or Courses by Agricultural CTE Educator

Topics or Courses	% Interest
Agriculture Technology	63
Soil/Plant Science	61
Animal/Veterinary Science	60
Technology Usage in Education	59
Professional Development	51
Natural Resources	43
Leadership Development Courses	39
Agriculture in Society	27
Agriculture Economics	22
Entomology Courses	18
Education Courses	14
Management Courses	14
Business Courses	11

Objective 4 was designed to evaluate the influence of cost on use and demand for extended educational alternatives. Sixty-one percent of the agricultural CTE educators indicated that cost is a barrier in obtaining additional education or training, 30% stated cost was not a factor, and 9% were unsure or did not have an answer as reported in Figure 2.

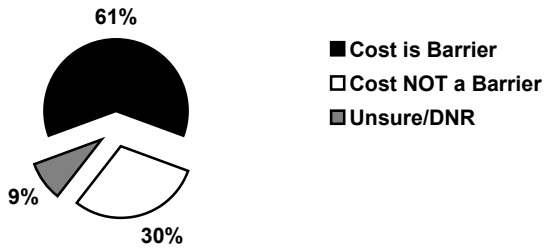

Figure 2. Cost as a Barrier to Obtaining Additional Education or Training

Objective 5 focused on the desired method of delivery for additional education or training opportunities by agricultural CTE educators. Forty-seven percent of the agricultural CTE educators wanted the courses delivered at a distance, 20% wanted the education in a traditional classroom setting, while 33% stated it did not matter (Table 4).

Table 4
Preferred Delivery Method of Courses

Method of Delivery	*%*
Traditional classroom setting	20
Distance: Delivered to my home	47
Does not matter	33
Not reported	3

Sixty-seven percent of the agricultural CTE educators were somewhat to very interested in obtaining a Master's of Science in Agriculture if it was available through distance education. Twenty-two percent were somewhat uninterested to very uninterested in obtaining a master's degree and 11% had no answer or were unsure.

Conclusions

Agricultural CTE educators desire additional education or training for personal or professional growth. This additional education or training needs to be available to them in their home area and can be met with the use of distance education. The distance education methods viewed most favorably are short courses, seminars and conferences. The use of videotapes and the Internet should be available to help assist agricultural CTE educators in meeting their own educational goals.

Based upon the findings reported in this study, the following recommendations have been formulated.

1. Enhance and/or expand the educational opportunities for agricultural CTE educators by utilizing short courses, seminars and conferences.
2. Increase the availability of additional education or training for agricultural CTE educators.
3. Increase the amount of extended educational alternatives for agricultural CTE educators who have not obtained their Master's degree.
4. Agricultural CTE educators desire immediate availability of courses such as agriculture technology, plant and animal sciences, and educational technology.
5. Explore additional educational funding opportunities, such as

financial aid, scholarships and grants, for agricultural CTE educators to help them in obtaining additional education or training.
6. Make extended educational alternatives available by distance education for agricultural CTE educators.
7. Agricultural CTE educators want to acquire a Master's of Science in Agriculture by methods of distance education.

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