

# COOPERATIVE EXTENSION AGENTS PERCEPTIONS OF DISTANCE EDUCATION COMPETENCE, VALUE, AND TECHNOLOGICAL SUPPORT

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## Abstract

The purpose of this study was to determine Cooperative Extension Service professionals' perceptions regarding their distance education competence, the value placed upon distance education, and the perceived availability of technological support. A random sample of 180 Agents was selected from a target of 750. A 56% response rate was achieved. Data from the survey indicated that the population was almost equally divided between male and female and most Agents were between the ages of 30 and 50. Almost half of the population had over 15 years experience and a majority were agriculture Agents. Most Agents had never delivered a program using distance education technology and very few of the Agents felt that learning required face-to-face meetings. Almost none of them were philosophically opposed to distance education. Agents perceived themselves as not competent in using the technology and instructional methods for distance education but they place a high amount of value on distance education. There was a definite need to increase the amount of information and technology support available. Very few were philosophically opposed to distance education. Overall it can be concluded that Agents place a high value on distance education but do not perceive they have the competence, information technology, or support to effectively deliver programs using distance education technology.

## Introduction

Fulton (1992) stated that “part of Extension’s mission has been to offer continuing education for professionals, the opportunity to take college level courses in rural areas, and short courses to help farmers and small businesses adapt to new technologies. Traditionally these courses have been offered on site which cost in time and travel.” Implementation of distance technologies can drastically decrease this cost but only with Agent acceptance of the technology. LaPaglia (1998) reported that at least one-third of the Farmer-Stockman readers have access to the resources available on the Internet. Tennessen, PonTell, Romine, and Motheral (1997) state that Extension should continue to embrace the use of the Internet and Lippert, Plank, and Radhakrishna (2000) concluded that the regional Extension in-service training over the internet is effective for theoretical and applied knowledge acquisition.

There is a current view that distance education courses require a greater effort and time commitment by faculty. Visser (2000) found that developing distance education courses can call for up to twice as much time and effort to accomplish the task. The findings also support the need for further research in this area to investigate what implications course content and distance technology used have on requirements for instructor preparation and delivery of the class. These requirements may also impact the philosophical position instructors have towards distance education.

Although there is a growing body of literature on the perceptions of teaching faculty at universities on distance education technology, almost no research has been conducted on the extension professionals and their perceptions and implementation of the technology. This study will attempt to ascertain these perceptions within the extension community. A study of this nature may also allow a comparison of agriculture faculty and extension professionals in respect to their perceptions of distance education technology.

## Theoretical Framework

Research in the field of distance education has recognized the need for a change and modification of the faculty role in teaching at a distance (Wedemeyer, 1981; Beaudoin, 1990; Dillion & Walsh, 1992; Purdy & Wright, 1992). It is not the distance education technology that drives the instruction but rather the primary changes in teaching style, technique, and motivation that must take place for technology assisted instruction in the present and future to function effectively (Purdy & Wright, 1992). Many studies cite faculty resistance to instructional technology as a primary barrier to the continued growth of distance education programs (Gunawardena, 1990; McNeil, 1990). How faculty perceive and react to these technologies are more important than the structural and technical obstacles in affecting the use of technology in distance education (McNeil, 1990). Murphy (2000) found that student success and satisfaction in distance education courses was substantially and positively correlated to their interaction with instructors.

Dooley & Murphy (2001) found that College of Agriculture faculty lacked experience in teaching learners at a distance, and that they were much more confident in their technical competence than they were in their methodological or pedagogical ability to use modern

technologies in their teaching. These authors further found that training and assistance in the use of instructional technologies were less available than equipment and facilities. Further, faculty members who had not participated in distance education perceived the level of support as lower than those who had taught courses at a distance. Faculty generally did not perceive the climate to be supportive of the use of technology. The ability of an organization to adapt to change is influenced by: competence or the knowledge, skills, and abilities of its staff; value or the amount of importance the staff places on the role of these technologies to accomplish teaching and learning; information technology support or the availability of high quality facilities, equipment, technical support, and training (Dooley & Murphy, 2001).

Lindner, Murphy & Dooley (2001) found that tenure status and academic rank have an effect on the adoption of distance education models. Non-tenured, Assistant Professors had the highest distance education competency scores. This led to the conclusion that newer faculty are being hired with the expectation of using distance education technologies and already possess the self-efficacy and skills to integrate technology. It was further noted that faculty who were comfortable and competent were the ones discouraged from participating in distance education due to current policies for promotion and tenure. The study also found that female faculty had higher distance education value scores than males and stated a need for further research in this area.

As Universities and Cooperative Extension Services consider and adopt distance education models, more information is needed on teacher's philosophical positions towards the distance educational model used to deliver instruction. Such information may be useful in determining strategies, procedures, and processes necessary for delivery at a distance.

### Purpose of the Study

The purpose of this study was to determine Cooperative Extension Service professionals' perceptions regarding their distance education competence, the value they assign to distance education, and their perception of the availability of technological support in the use of distance education technologies. The specific objectives were:

1. Describe the perceptions of Cooperative extension agents regarding competence in using distance education technology.
2. Describe the perceptions of Cooperative extension agents regarding the value they assign to distance education technology.
3. Describe the perceptions of Cooperative extension agents regarding the availability of technology and support

### Methodology

The research design used for this study was descriptive in nature. The study was designed to examine the factors affecting the adoption of distance education technology by Cooperative Extension Agents in the State of Texas. The conceptual schema for this study was based on the research performed by Lindner, Murphy, & Dooley (2001) which focused on three factors affecting faculty adoption of distance education: competency, value, and educational technology support.

The population for this study included all field Agents in the Texas Cooperative Extension Service. Inferences to other similar populations should be handled with caution as other organizations may differ greatly from this one. The participants were selected using simple random sampling techniques (Gall, Borg, & Gall, 1996). The sample size was calculated using Krejcie & Morgan's (1970) convention and was then chosen using systematic random procedure. Every fourth name from an alphabetical list was pulled from a random starting place and selected for the sample population. The population was determined to be 750 field Agents, from that a random sample of 180 Agents were selected. A total of 102 Agents completed the questionnaire for a response rate of 56%.

The reliability and content validity of the instrument has been well established by Murphy & Terry (1995), Dooley & Murphy (2001), Lindner, Murphy & Dooley (2001), and Jones, Lindner, Murphy, Dooley (2002). Nonresponse error was controlled by comparing early responses to late responses (Lindner, Murphy & Briers, 2001).

Data collected was analyzed using the Statistical Package for Social Sciences (SPSS, 10.0.0, Inc., 2001). Descriptive statistics were calculated for each variable. Alpha for all statistical procedures was set a priori at .05. Effect size was calculated, interpreted, and reported according to procedures established by Cohen (1988). Cell frequencies and percentages were used to summarize agreement or disagreement with statements related to distance education competence, importance, and quality of infrastructure. Respondents who indicated "agree" and "strongly agree" or those indicating "disagree" or "strongly disagree" were reported. Thus, those respondents who indicated "neutral" were considered as not having a strong opinion about the given statement.

## Findings

### *Objective 1*

The perceived distance education competence section was made up of ten questions based on Lindner, Murphy, & Dooley's (2001) model. Responses to these questions determined the Agents' perceived level of competence with distance education technologies and concepts. Calculating the frequencies and percentages of the responses yielded the statements with which the Agents most strongly agreed.

Agents only perceived themselves as competent in association with three of the statements. When asked if they were comfortable connecting a computer to the various output devices available (LCD projector, TV, etc.) 68 agreed or strongly agreed. Sixty-one either agree or strongly agree that they can create their own presentation using PowerPoint, Corel Presentation, Persuasion, etc. Equal amounts agree or strongly agree that they use email for almost all their correspondence. The majority of the responses to questions regarding distance education competence were negative. The statement "I am comfortable creating my own WWW homepage" received the greatest negative response with 71.6% of the responses being disagree or strongly disagree. Seventy-one (69.6%) of the Agents perceived an inability to record and use digital sound in presentations and 65.7% replied negatively to being familiar with the instructional methods appropriate for distance education. A large number of the Agents, (63), felt uncomfortable sending important and confidential documents through email and an almost equal

number, (60), believed they could not confidently deliver instruction over the web. These data are presented in Table 1. A distance education competency score was calculated by averaging the 10 items used to describe competency. Responses tended to indicate “neutral” to statements used to measure distance education competence ( $M= 2.83$ ,  $SD= .76$ ).

Table 1  
*Cooperative extension agents' perceptions regarding their competence in using distance education technologies*

| <i>Statement</i>  | Strongly Agree |          | Agree    |          | Neutral  |          | Disagree |          | Strongly Disagree |          |      |
|---|----------------|----------|----------|----------|----------|----------|----------|----------|-------------------|----------|------|
|   | <i>f</i>       | <i>%</i> | <i>f</i> | <i>%</i> | <i>f</i> | <i>%</i> | <i>f</i> | <i>%</i> | <i>f</i>          | <i>%</i> |      |
| I am comfortable creating my own WWW homepage   | 102            | 5        | 4.9      | 11       | 10.8     | 13       | 12.7     | 40       | 39.2              | 33       | 32.4 |
| I am comfortable creating my own presentation graphics using software like PowerPoint, Corel Presentation, Persuasion, etc. | 102            | 25       | 24.5     | 36       | 35.3     | 12       | 11.8     | 17       | 16.7              | 12       | 11.8 |
| I use email for almost all my correspondence.   | 102            | 23       | 22.5     | 38       | 37.3     | 21       | 20.6     | 19       | 18.6              | 1        | 1.0  |
| I send most important and confidential documents through email.   | 102            | 7        | 6.9      | 12       | 11.8     | 20       | 19.6     | 45       | 44.1              | 18       | 17.6 |
| I am able to scan photographs into digital files.   | 102            | 23       | 22.5     | 34       | 33.3     | 6        | 5.9      | 26       | 25.5              | 13       | 12.7 |
| I am able to record and use digital sound in my presentations.  | 102            | 3        | 2.9      | 17       | 16.7     | 11       | 10.8     | 41       | 40.2              | 30       | 29.4 |
| I am familiar with the instructional methods appropriate for distance education.  | 102            | 1        | 1.0      | 16       | 15.7     | 18       | 17.6     | 43       | 42.2              | 24       | 23.5 |
| I could confidently deliver instruction over the web.   | 102            | 4        | 3.9      | 19       | 18.6     | 19       | 18.6     | 32       | 31.4              | 28       | 27.5 |
| I could confidently deliver instruction over the TTVN.  | 102            | 5        | 4.9      | 22       | 21.6     | 29       | 28.4     | 25       | 24.5              | 21       | 20.6 |
| I am comfortable connecting a computer to the various output devices available (LCD projector, TV, etc.).                   | 102            | 31       | 30.4     | 37       | 36.3     | 13       | 12.7     | 15       | 14.7              | 6        | 5.9  |

Note:  $M= 2.83$ ,  $SD=.76$ ; Scale: 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree

### *Objective 2*

The perceived value component of the survey used nine statements to attempt to ascertain the value Agents perceived themselves placing on distance education. The response to this component was largely positive. The statement “electronic information technologies provide clients with instantly available supplemental material” obtained the greatest positive response with 95.4% of the Agents stating they agree or strongly agree. When asked if the Internet/WWW are convenient ways to access information 91.1% responded positively and 62.7% of the selected strongly agree. Ninety (88.3%) of the respondents agreed or strongly agreed that clients today prefer a more visual learning experience. The statement “I think most programs would be improved by incorporating multimedia received a response of agree or strongly agree from 81.3% of the participants. When asked if animated graphics increase client interest and retention, 79.4% agreed or strongly agreed and 72.6% agree or strongly agree that electronic communications and information technology will drastically alter how we deliver programs in the next five years. Sixty-nine Agents (68.6%) agreed or strongly agreed that it is important to incorporate electronic information technologies in the programs they provide and 63.7% felt that electronic communications and information technologies will alter what we deliver in the next five years. These data are reported in Table 2. A distance education value score was calculated by averaging the 9 items used to describe value. Responses tended to indicate “agree” or “strongly agree” to statements used to measure distance education value (M= 4.01, SD= .50).

### *Objective 3*

The results from the information technology and support section indicated a strong negative response to the support perceived as available by Agents. Table 3 illustrates that of the eight statements only five showed significant response.

The statement “there are enough employee development workshops regarding videoconferencing” received the most negative responses at 70. An almost equal number (n=68, 66.6%) of Agents disagreed or strongly disagreed with the statement “There are ample opportunities to secure employee development on using multimedia and videoconferencing equipment.” Sixty one (59.8%) Agents disagreed or strongly disagreed that they were aware of the personnel responsible for scheduling TTVN and 54 respondents disagreed or strongly disagreed that they have access to technical assistance when instructing at a distance. Participants answered negatively (n=53, 52% disagree or strongly disagree) when questioned whether the equipment needed to produce and display multimedia instructional material is readily available to them. A distance education information technology and support score was calculated by averaging the 8 items used to describe information technology and support. Responses tended to indicate “disagree” or “strongly disagree” to statements used to measure distance education information technology and support (M= 2.56, SD= .67).

Table 2

*Cooperative extension agents' perceptions regarding the value they assign to distance education technologies*

| <i>Statement</i>   | Strongly Agree |          | Agree    |          | Neutral  |          | Disagree |          | Strongly Disagree |          |     |
|--|----------------|----------|----------|----------|----------|----------|----------|----------|-------------------|----------|-----|
|  | <i>f</i>       | <i>%</i> | <i>f</i> | <i>%</i> | <i>f</i> | <i>%</i> | <i>f</i> | <i>%</i> | <i>f</i>          | <i>%</i> |     |
| The Internet/WWW are convenient ways to access information.  | 102            | 64       | 62.7     | 29       | 28.4     | 7        | 6.9      | 1        | 1.0               | 1        | 1.0 |
| Participation in listservs, threaded discussion groups, chats, and /or other electronic communications offer great benefits. | 102            | 15       | 14.7     | 32       | 31.4     | 48       | 47.1     | 5        | 4.9               | 2        | 2.0 |
| Electronic communications and information technology will drastically alter HOW we deliver programs in the next five years.  | 102            | 32       | 31.4     | 42       | 41.2     | 19       | 18.6     | 9        | 8.8               | 0        | 0.0 |
| Electronic communications and information technology will drastically alter WHAT we deliver in the next five years.          | 102            | 25       | 24.5     | 40       | 39.2     | 20       | 19.6     | 17       | 16.7              | 0        | 0.0 |
| I think most programs would be improved by incorporating multimedia.   | 102            | 23       | 22.5     | 60       | 58.8     | 17       | 16.7     | 2        | 2.0               | 0        | 0.0 |
| Animated Graphics increase client interest and retention.  | 102            | 27       | 26.5     | 54       | 52.9     | 16       | 15.7     | 4        | 3.9               | 1        | 1.0 |
| Clients today prefer a more visual learning experience.  | 102            | 37       | 36.3     | 53       | 52.0     | 10       | 9.8      | 2        | 2.0               | 0        | 0.0 |
| Electronic information technologies provide clients with instantly available supplemental material.                          | 102            | 37       | 36.6     | 60       | 58.8     | 5        | 4.9      | 0        | 0.0               | 0        | 0.0 |
| It is important that I incorporate electronic information technologies in the programs I provide.                            | 102            | 21       | 20.6     | 49       | 48.0     | 25       | 24.5     | 5        | 4.9               | 2        | 2.0 |

Note:  $M= 4.01$ ,  $SD=.50$ ; Scale: 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree

Table 3

*Cooperative extension agents' perceptions regarding the availability of distance education information technologies and support*

| <i>Statement</i>  | Strongly Agree |          |          |          | Neutral  |          | Disagree |          | Strongly Disagree |          |      |
|---|----------------|----------|----------|----------|----------|----------|----------|----------|-------------------|----------|------|
|   | <i>f</i>       | <i>%</i> | <i>f</i> | <i>%</i> | <i>f</i> | <i>%</i> | <i>f</i> | <i>%</i> | <i>f</i>          | <i>%</i> |      |
| The equipment needed to produce and display multimedia instructional materials is readily available to me.        | 102            | 7        | 6.9      | 26       | 25.5     | 16       | 15.7     | 32       | 31.4              | 21       | 20.6 |
| I am aware of the necessary procedure to secure electronic presentation equipment.                                | 102            | 8        | 7.8      | 29       | 28.4     | 25       | 24.5     | 25       | 24.5              | 15       | 14.7 |
| I have access to facilities that are designed to support the use of multimedia.                                   | 102            | 3        | 2.9      | 28       | 27.5     | 24       | 23.5     | 29       | 28.4              | 18       | 17.6 |
| There are ample opportunities to secure employee development on using multimedia and videoconferencing equipment. | 102            | 2        | 2.0      | 6        | 5.9      | 26       | 25.5     | 44       | 43.1              | 24       | 23.5 |
| There are enough employee development workshops regarding videoconferencing.                                      | 102            | 0        | 0.0      | 7        | 6.9      | 25       | 24.5     | 44       | 43.1              | 26       | 25.5 |
| I have access to technical assistance when instructing at a distance.   | 102            | 2        | 2.0      | 10       | 9.8      | 36       | 35.3     | 37       | 36.3              | 17       | 16.7 |
| The time spent developing program materials is valued by extension.   | 102            | 4        | 3.9      | 39       | 38.2     | 33       | 32.4     | 12       | 11.8              | 14       | 13.7 |
| I am aware of the procedure, office, and personnel responsible for scheduling TTVN.                               | 102            | 4        | 3.9      | 21       | 20.6     | 16       | 15.7     | 30       | 29.4              | 31       | 30.4 |

Note:  $M=2.56$ ,  $SD=.67$ ; Scale: 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree

## Conclusions, Discussion, and Recommendations

### *Objective 1*

Overall mean distance education competency scores ( $M=2.83$ ;  $SD=.76$ ) illustrate that Texas Cooperative Extension Agents tended to indicate neutral on the items used to measure competence. Agents tended to have a higher perceived competence in their ability to use distance education technology and a lower perceived competence in their methodological ability to incorporate these technologies into their teaching. This finding is consistent with that of Dooley and Murphy (2001) who found similar findings when studying teaching faculty members in the College of Agriculture and Life Sciences at Texas A&M University. Their recommendations for faculty development are also applicable to Extension Agents. Distance education training and development efforts for Agents should include specific methods for using distance education technologies to enhance and extend teaching. Cooperative Extension needs to increase the training programs in the areas of webpage design, email security, digital audio, and distance education instruction and delivery methods in order for Agents to take full advantage of the investments being made in equipment and resources. This recommendation is problematic when taking to account the Agents current perception of an inadequacy in information technology and support available to them.

### *Objective 2*

Agents' responses in this section indicated that they place a high amount of value on distance education. This supports Dooley & Murphy's (2001) findings that agricultural teaching faculty members value these technologies and recognized in general that they are and will be an important part of the instructional process. However when compared to their perception of distance education competence and information technology support it becomes apparent that there is the tendency not to use the technology either from perceived lack of distance education competence, lack of information technology and support, or both. This implies that even though Agents feel confident with some technologies and value distance education, there remains the fact the very few of them engage in instruction using distance education technologies. It is recommended that Cooperative Extension maintain and increase the high level of value Agents place on distance education by increasing the Agents distance education competency through additional training opportunities and increase the amount of technology and support available to the Agents.

### *Objective 3*

Cooperative Extension Agents identified a definite need to increase the amount of information and technology support available to them. Collison, G., Elbaum, B., Haavind, S., & Tinker, R. (2000); Kearsley, (2000); and Rosenberg, (2001) suggested that becoming an effective distance educator requires unique training and competencies. Spodick (1995) concurs, stating that training and support are essential. It can then be concluded that the reason Agents do not engage in instruction delivered through distance education methods is the lack of technology and support. These conclusions again support those of Dooley & Murphy (2001). They state that infrastructure was perceived as multifaceted and in general lacking. The teaching faculty members perceived that support and training were less available than equipment. Cooperative Extension Agents will continue to avoid using distance education methods and technologies until Cooperative Extension must increase the amount and availability of technology and support.

Overall it can be concluded that Agents place a high value on distance education but do not perceive they have the competence, information technology, or support to effectively deliver programs using distance education technology. In order to maintain this high level of value, Cooperative Extension needs to increase the availability of even the most basic technology. As of this writing there was an Agent who lost accessibility to email at the office for a period of three months and did not have the resources at home to access email accounts. It is unacceptable for Agents to lose what has become a vital communication tool for any extended period of time. Cooperative Extension also needs to provide the county office with updated technology for applications as simple as PowerPoint presentations and as complex as basic video/sound editing programs that cannot be run on their antiquated equipment. Once these technologies are in place Cooperative Extension must provide training in order for Agents to take full advantage of the opportunities these technologies provide.

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