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FACTORS INFLUENCING FACULTY PARTICIPATION IN WEB-BASED DISTANCE EDUCATION TECHNOLOGIES

DISSERTATION

Presented in Partial Fulfillment of the Requirements for the Degree Doctor of Philosophy in the Graduate School of The Ohio State University

By

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* * * * *

The Ohio State University
2002

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ABSTRACT

The use of web-based technologies continues to grow. College and universities must take a proactive stance to meet the educational needs of society in the 21st Century. The adoption and use of web-based technologies are the methods that colleges and universities can embrace to meet the task of educating the students of the 21st Century. Greater use of web-based distance education technology is needed to improve productivity and expand access to agricultural programs.

The purpose of this descriptive-correlational study was to investigate factors which influenced faculty participation in web-based distance education technologies for delivering instruction in agricultural programs. In addition, the study sought to discuss faculty perceptions on their level of competence, level of importance, availability of infrastructure, training, and perceived major barriers faced in using web-based distance education technologies for delivering instruction in agricultural programs. Multiple regression analysis was used to predict factors that influenced faculty participation in web-based distance education.

Based on the 85 (88%) of the responses, findings of this investigation suggested that agricultural teacher educators have a high level of competence/skills using web-based...
technologies. In addition, this study found that agricultural teacher educators considered the use of web-based technologies to enhance their teaching to be helpful and important. Concerning the availability of infrastructure provided by institutions, agricultural teacher educators indicated that training, technical assistance and equipment are available to use. Agricultural teacher educators identified six major barriers that would inhibit their decision to participate in using web-based technologies to deliver distance education. Those barriers were: (1) the lack of administratively provided time, like professional development leave, to learn to use web-based technologies; (2) the lack of a reward and incentives that encourages faculty to participate in web-based distance education; (3) the lack of credit toward tenure and promotion; (4) concern about workload; (5) the lack of grants materials/expenses (funding); and, (6) concern about the effects of distance education technology on the quality of the courses. Finally, regression model yielded two predictors variables: Level of competences/skills and lack of grant material/expenses (funding). The variables included in multiple regression model accounted for 33% of the faculty participation in web-based distance education.
DEDICATION

This research study is dedicated

First, to The Alpha and The Omega, Who is, and Who was, and Who is to come, the Almighty God, because without faith it is impossible to please God, and this research is a testimony of faith.

Second, to the one who gave up everything to walk with me in the most intense and struggling journey of my life. To you, who decided wisely to believe in me even though the worst circumstances surrounded my life. Thanks for never giving up on me, for your patience, advise, hours and hours of support and love. ¡Lo logramos!

Third, to my silent prayer warrior, my mom, who taught me how to conquer the impossible when you have faith.
ACKNOWLEDGMENTS

First, I would like to thank God for giving me the opportunity to embark on this challenge and for blessing me with the patience to see it through to completion. I pray that He guides me to use all that I have learned to help others achieve their educational goals.

I would like to express my sincere appreciation to individuals whose support and encouragement has been invaluable in my doctoral studies. I would first like to recognize Dr. Jamie Cano who was my major adviser, whose faith in me drove me toward interesting learning activities in which I became a better researcher. In addition, I had the honor to have Dr. Wesley Budke and Dr. M. Susie Whittington in my doctoral program and dissertation committee; thank you for your understanding, support, and encouragement during the research process.

I would also like to express special appreciation to Dr. David Padilla. Dr. Padilla formally introduced me to agricultural education as an area of inquiry, and encouraged me to research and teach agricultural education courses. It has been a pleasure to work with him on a number of meaningful projects. His constant feedback, support, and wise advise during this journey is widely appreciated. Thank you, David, for leading me in this learning process; it is an honor to be your mentee.
A special thanks to my friend, Brian Sanford, who sat with me on numerous occasions to review and revise the literature review chapter needed to support the research questions. His encouraging words, comfortable manner, and sound advice throughout the process gave me a measure of stability that was both needed and very much appreciated.

I am deeply indebted to the Lee family, Joseph, Grace, Joy, Marie, Josie, and Ruthie, who have been my family, my friends, my confidants, my supporters, and my intellectual sounding board throughout these three years. I thank Grace, for her patience and understanding when I worked on this project and for her constant love. I also thank Joy Lee for her song “Give Me More” which has became the motto of these last steps in my doctoral dissertation process. Thank you, girl.

Great appreciation is expressed to the wonderful friends who share this experience with me: Edly Santiago Andino, Edlyn Otero, and Carmen S. Alvarez.

Finally, I would like to thank my family for their support, love, and encouragement throughout all the years I have been in Columbus.
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Studies in Agricultural Education
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CHAPTER 1

INTRODUCTION

Technology has been the source of much revolutionary activity in many of the functions at colleges and universities. Today, something new and very important is occurring. New web-based technologies in academic instruction and communication are establishing a foothold on many American campuses, and in time, these technologies may significantly influence the way these institutions of higher education perform their basic mission of educating learners (Brooks, 1999). Distance learning (DL) is one product of these developments. Kayworth and Koch (1997) stated that distance learning was one of education's "boom" areas, and that it was growing to where some experts predicted that it would eventually become the normal mode of instruction.

A national study (U.S. Congress, Office of Technology Assessment, 1989) reported that nearly half of the state colleges and universities surveyed offered distance education (DE) courses. Ten percent of state colleges and universities awarded full degree programs via distance education (U.S. Congress, Office of Technology Assessment, 1989). Clearly, the most prominent trend was the exploding number and
variety of distance education courses offered by state colleges and institutions of higher education (Distance Education Policy Recommendation, 1996). Distance learning is emerging as an increasingly important educational component of higher education's instructional delivery systems (Greene & Meek, 1997). Furthermore, Jayaraman and Piper (1998) added that the market for distance learning (DL) had experienced significant expansion and was expected to grow at a rate of 25% to 35% per annum over the next few years. Today, many educational institutions are taking advantage of telecommunications technology by developing and delivering distance education conferences, workshops, courses, and programs. The increasing availability of telecommunications has also provided agricultural faculty, extension educators, and professionals with unique opportunities to plan and deliver distance education courses and programs. However, Newcomb (1992) indicated that agricultural distance education would not reach its potential until educators learned to plan and deliver instruction differently, using a variety of methods and techniques.

Moreover, collegiate faculty members are increasingly being asked to teach in a distance-learning environment. Many of these DL faculty members are not adequately prepared for their DL obligations (Brooks, 1999). Brooks (1999) stated that the educational model for delivering instruction broadens, technologies continue to advance, educational delivery methods continue to expand, and audiences become more diversified, faculty remain a key element in the teaching and learning process. Olcott and Wright (1995) indicated that the responsibility for instructional quality and control, the improvement of learning, and the aggregate effectiveness of distance education still rested with the faculty.
Ultimately, it is the faculty who need to be aware of diverse technologies and delivery methods available for distance education so they can incorporate them into their teaching and learning strategies. To use distance-learning strategies, faculty may need to alter teaching styles used within the "traditional classroom," and develop new skills to effectively reach the distant learner. Dillon and Walsh (1992), and Clark (1993), both observed that faculty using distance education technology faced a variety of challenges when adapting their teaching styles to a framework compatible with the distance-learning environment. In 1992, the Corporation for Public Broadcasting reported to Congress that faculty needed to understand the relationship between learning, interactivity, and technology, as well as how to operate the technology. Willis and Touchstone (1996) indicated that to be successful in distance education, faculty needed training before their initial teaching experience. Therefore, the challenge is to prepare faculty for the distance teaching experience. While opportunities have existed for delivering distance education, faculty often expressed concerns about teaching via distance (Carl, 1991; Clark, 1993; Olcott, Jr. & Wright, 1995).

Furthermore, Rockwell, Schauer, Fritz, and Marx (1999) found that faculty reported major obstacles to teaching via distance were developing effective technology skills along with obtaining necessary assistance and support. For faculty to be successful in distance education teaching, higher education institutions must take into account the wants, needs, interests, and aspirations of the faculty in an effort to help faculty develop distance learning educational models and techniques.
Statement of the Problem

Distance education uses communication technologies, such as web-based technology, to link vast arrays of resources and makes technologies available to stimulate and support the development of learning skills (Brooks, 1999). However, more information is needed about the distance-learning environment thus that faculty, administrators, institutions, and students can be successful in that setting. Therefore, institutions of higher education have become obligated to reexamine information technology as a tool for increasing the academic and administrative potential of faculty, staff, and students. Even though an increasing amount of research is being conducted in the field of distance education, most current research into distance learning has focused on the students, the curriculum, and the technology (Dillon & Walsh, 1992; Purdy & Wright, 1992). However, Beaudoin (1990) argued that the importance of the faculty as a group has been largely neglected by much of the current research.

The problem is that there is insufficient information to clarify factors which influenced faculty participation in web-based distance education for delivering instruction in agricultural programs. In order to improve facilitation of faculty involvement in web-based distance education, it is necessary to study and determine what factors influenced faculty members' to participate in web-based distance education from a faculty perspective. Because of the limited research regarding the factors influencing faculty participation in web-based distance education, an in-depth study to identify those factors was appropriate. Faculty level of competence, level of importance, availability of infrastructure training and major barriers faced in using web-based distance education
technologies can provide important information to use in sustaining faculty members and in helping distance education programs achieve higher levels of efficiency and effectiveness.

Purpose of the Study

The purpose of this descriptive-correlational study was to investigate factors which influenced faculty participation in web-based distance education for delivering instruction in agricultural programs at land grant institutions. In addition, the study sought to discuss faculty perceptions on their level of competence, level of importance, availability of infrastructure, training, and perceived major barriers faced in using web-based distance education technologies for delivering instruction in agricultural programs.

To guide the study, the following research objectives were investigated:

1. Describe what were the selected personal and professional characteristics (age, gender, tenure status, and years of teaching experience, teaching load, academic rank, and region) of agricultural teacher educators (faculty).

2. Describe how many of the faculty had a website, how used, where the course website resided, software used, computer operating system used, and who created or maintained the website.

3. Describe training related to the use of web-based and videoconferencing technology to deliver distance education, where training on web-based and videoconferencing technologies was received, and how many courses have been taught using web-based distance education by the agricultural teacher educators.
4. Describe what was the perceived level of competence that agricultural teacher educators have in the use of web-based technologies.

5. Describe agricultural teacher educators perceptions of the level of importance of web-based technologies have or will have in teaching and learning.

6. Determine the perceived availability of infrastructure for agricultural teacher educators to use web-based technologies.

7. Describe what the agricultural teacher educators perceived as major barriers for participating in the use of web-based technologies for delivering distance instruction in agricultural settings.

8. Describe what relationship existed between:
   a. The perceived level of competence and selected personal and professional characteristics (age, gender, rank, tenure status, year of teaching experience and prior experience in teaching courses using distance education, and training in web-based technologies).
   b. The perceived level of importance and selected personal and professional characteristics (age, gender, rank, tenure status, year of teaching experience and prior experience in teaching courses using distance education, and training).
   c. The perceived availability of infrastructure, and level of competence.
   d. The perceived availability of infrastructure, and level of importance.
   e. The perceived major barriers and the level of importance.
   f. The perceived major barriers and the level of competence.
9. Explain the variance in the dependent variable, participation in web-based
distance education, through a linear combination of the independent variables.

The following research hypotheses were generated for question #8

a. There is no relationship between the perceived level of competence and
selected personal and professional characteristics (age, gender, rank,
tenure status, year of teaching experience and prior experience in teaching
courses using distance education, and training).

b. There is no relationship between the perceived level of importance and
selected personal and professional characteristics (age, gender, rank,
tenure status, year of teaching experience and prior experience in teaching
courses using distance education, and training).

c. There is no relationship between the perceived availability of
infrastructure, and level of competence.

d. There is no relationship between the perceived availability of
infrastructure, and level of importance.

e. There is no relationship between the major barriers and the level of
importance.

f. There is no relationship between the major barriers and the level of
competence.

Significance of the Study

This study investigated factors which influenced agricultural teacher educators
participation in web-based distance education for delivering instruction in agricultural
programs. In addition, the study sought to discuss agricultural teacher educators
perceptions of their level of competence, level of importance, availability of infrastructure, training and perceived major barriers faced in using web-based distance education technologies for delivering instruction in agriculture programs. As has been stated, there was limited research from the faculty perspective, and this study was intended to provide new light on factors which influenced agricultural teacher educators participation in web-based distance education (Beaudoin, 1990; Dillon & Walsh, 1992; Northrup, 1997). This study was unique because it was not treated as a student-based outcome measure, but an agricultural teacher educator (faculty) based process measure. By discussing factors which influence agricultural teacher educators' participation in web-based distance education for delivering distance education courses in agricultural programs, this study provided a unique look at the distance education environment in which agricultural teacher educators had a chance to express their views on the important issues facing them in the distance-learning classroom.

By observing the distance education environment from the agricultural teacher educators' viewpoint, one gained a valuable and different observation of faculty concerns in the distance-learning classroom. The agricultural teacher educators' perspective is a much-needed source of information in the distance-learning environment. In addition, it was important that this research raise the level of knowledge in the distance-learning field.

This study was designed to provide more information in a field that is rapidly growing and becoming more accepted, both practically and for scholarship. Distance learning is emerging as an increasingly significant component, or tool, in higher education
(Greene & Meek, 1997). The findings from this study provided information which could be used on its own merit or with the results from other studies in distance education technologies.

The current study adds to the research that has been done on faculty issues in the distance education environment (Beaudoin, 1990; Dillon, 1989; Dillon & Walsh, 1992; Dillon, Hengst, & Zoller, 1991; Northrup, 1997; Wolcott, 1997; Pajo & Wallace, 2001; Dooley & Murphy, 2001; Murphy & Terry, 1998; and Murphy & Dooley, 2001). The identified scholars have urged that further research be conducted in distance learning from the faculty perspective.

Most of the concerns raised about distance learning issues (time, access, training, organization skills, faculty competences, major barriers, level of importance) were included in the survey instrument used in the current study. The researcher recognized that many issues needed to be addressed, and tried to incorporate as many of them as possible in the list of factors. By identifying the critical factors which required attention for agricultural teacher educators to be effective and efficient in their distance-learning classrooms, this study provided the agricultural teacher educator members with a better understanding of what they did or needed to do that impacts classroom success. Additionally, the same information empowered administrators with the knowledge needed to provide the agricultural teacher educators members with proper support and training in the distance learning programs.
Limitation of the Study

The applicability of this research was limited to agricultural teacher educators listed in the American Association of Agricultural Educators (AAAE) directory on February 14, 2002. Since this study was exploratory descriptive-correlational in its nature, it was limited by the fact that the researcher may not have included all appropriate variables for predicting the dependent variables.

Basic Assumptions

The major assumption operating in the study was that the participants had a basic knowledge of web-based technologies used in distance education environment. Nasseh (1996) suggested that questionnaires needed to be based on three assumptions:

1. The agricultural teacher educators read and understand the question or items;
2. The agricultural teacher educators process the information to answer the question or items; and,
3. The agricultural teacher educators answer the survey included in this study honestly and accurately.

Definitions of Terms

Agricultural Teacher Educators

For the purpose of the current study, agricultural teacher educators is also called faculty (see faculty definition).

Barriers

Barriers are impediments to integrating web-based technologies (Jacobsen, 1998). For the purposes of defining the barrier variable, a Likert scale was used. The lower the barrier score the less inhibited agricultural teacher educators were in using web-based
technologies for distance education; the greater the barriers score the more inhibited agricultural teacher educators were in using web-based technologies for distance education.

The following range was used to identify the perceived major barriers for participating in the use of web-based technologies:

a) 5.00-4.50 High Barrier
b) 4.449-3.50 Moderate Barrier
c) 3.49-2.50 Neutral Barrier
d) 2.49-1.50 Low Barrier
e) 1.49-1.00 Not a Barrier

The high, moderate, neutral, low and not a barrier ranks were considered the measurement of what agricultural teacher educators perceived as major barriers which inhibit participation in using web-based technologies in distance education.

**Distance Education**

Distance education is an organizational process that results in learning through planned experiences with two main themes: the educator and learner(s) are separated by physical distance, possibly at different times; and, information technologies play a key role in maintaining the connection between the two. Examples of electronic technologies now used for this purpose are: interactive audio; video; computer conferencing; broadcast live video; recorded videotapes and CD-ROMs; virtual reality; simulations; chat rooms; live boards; e-mail; interactive Websites; on-line testing and self-assessment; computer-aided courses; and, web-based technologies. For the purpose of this study, distance education and distance learning will be used as synonyms terms.

11
Faculty

For the purpose of this study faculty included the agricultural teacher educators in the ranks of regular faculty. The ranks were professor, associate professor, and assistant professor. Each of the regular, active status ranks may be tenure accruing or non-tenure accruing as specified in the original letter of appointment.

Faculty Participation in Distance Education

Participation refers to teaching, co-teaching, designing courses, and/or providing consultation for distance education courses.

Faculty Non-Participation in Distance Education

Non-participation refers to not teaching, co-teaching, designing courses, and/or not providing consultation for distance education courses.

Likert Scale

A Likert scale is used in survey formats where a statement is followed by a scale of potential responses. Subjects check the place on the scale that best indicates their beliefs or opinions about the statement (McMillan & Schumacher, 1989). The likert scale used in this study was a five-point response scale. The response choices were: 1= “Strongly Disagree,” 2= “Disagree,” 3= “Neither Agree nor Disagree,” 4= “Agree,” 5= “Strongly Agree.”
Need for Support

In this study refers to faculty manifest statements of their desire for more access to equipment, communications, or training opportunities.

Perception

Perception is a single unified awareness derived from sensory processes while a stimulus is present (Kegan, 1982). Perception may be thought of as an individual's reality. "Distinguishing between how something appears and how something "is" is just what one cannot do when one is subject to the perceptions" (Kegan, 1982, p. 29).

Perceptions of Infrastructure Available

For the purpose of this study, perception of infrastructure available was the individual's judgment of the availability of equipment based on personal experience and opinion. The judgment may not be based on a systematic assessment. In addition, to measure the variable of infrastructure available each respondent’s item score was summarized. Greater scores indicated awareness of the infrastructure available for agricultural teacher educators to use; lower scores indicated agricultural teacher educators were not aware of the infrastructure available to use.

The following range was used to identify the level of perceived infrastructure available:

a) 5.00-4.50 High awareness
b) 4.49-3.50 Moderate awareness
c) 3.49-2.50 Neutral awareness
d) 2.49-1.50 Low awareness
e) 1.49-1.00 No awareness
The high, moderate, neutral, low, and no awareness ranks were considerate the measure of the perceived infrastructure that agricultural teacher educators indicated was available for using web-based technologies in distance education.

Survey

A survey is a self-reporting questionnaire used to gather information about a particular phenomenon.

Level of Competence

Competence is a specific range of skill, knowledge, or ability; is the state or quality of being adequately or well qualified. For the purpose of this study, each respondent's item score was summarized in order to define the perceived level of competence. The greater the level of competence/skills, the skilled towards use of web-based technologies in distance education; the lower level of perceived competence the less skilled towards use of web-based technologies in distance education.

The following range was used to identify the perceived level of competence:

a) 5.00-4.50 High Level of Competence
b) 4.49-3.50 Moderate Level of Competence
c) 3.49-2.50 Neutral Level of Competence
d) 2.49-1.50 Low Level of Competence
e) 1.49-1.00 No Competence

The high, moderate, neutral, low, and none ranks are considerate the measure of the perceived level of competence that agricultural teacher educators indicated were able to use web-based technologies for distance education.
Level of Importance

This term refers to the state or quality of being significant, influential, or worthy of note. For the purpose of this study, each respondent's item score was summarized in order to define the perceived level of importance. The greater the level of importance, the more value web-based technologies have or will have in teaching and learning; the lower level of perceived importance, the less value web-based technologies have or will have in teaching and learning.

The following range was used to identify the perceived level of importance:

a) 5.00-4.50 High Level of Importance
b) 4.49-3.50 Moderate Level of Importance
c) 3.49-2.50 Neutral Level of Importance
d) 2.49-1.50 Low Level of Importance
e) 1.49-1.00 Not Important

The high, moderate, neutral, low, and not important ranks were considered the measure of the perceived level of importance that the agricultural teacher educators indicated web-based technologies have in teaching at distance education.

Web-Based Technologies (either totally or enhanced)

For the purpose of this study, web-based technologies are the means by which material is delivered to students, that is, "media". Classification of media includes: videoconferencing; portable video; computer-based (e-mails, listserver, and most World Wide web-based courses), digital imaging (digital cameras, scanners, digital video) and Internet-based technologies.
Summary

The current study investigated factors which influenced agricultural teacher educators participation in web-based distance education for delivering instruction in agricultural programs. In addition, the study sought to discuss agricultural teacher educators perceptions of their level of competence, level of importance, availability of infrastructure, training and perceived major barriers faced in using web-based distance education technologies for delivering instruction in agriculture programs. In addition, this study will provide information that will assist in the further development, planning, and implementation of methods to improve the agricultural teacher educators attitudes and competence that will help institutions for the integration of web-based technologies in distance education programs. Chapter 2 contains a literature review describing issues involved in faculty attitudes toward the use of web-based technologies to deliver distance education programs. Chapter 3 describes the research design, survey instrument, data collection, and data treatment. Following data collection, Chapter 4 analyzed the data using a computer statistical program. Chapter 5 summarizes the information discovered in the data analysis, draws conclusions, and makes several recommendations for further study.
CHAPTER 2

REVIEW OF LITERATURE

The integration of new technologies in higher education is inevitable (Gilbert, 1995). According to Murphy and Terry (1995), "The development and use of communications technologies and instructional systems currently taking place are certain to bring about change in education" (p. 28). Wilkinson and Sherman (1991) stated that technology to deliver and receive educational programs over distance has become more accessible and acceptable. Furthermore, Moore and Thompson (1990) indicated that many states were in the process of installing telecommunications technology to allow distance education to occur at all levels of education.

Looking to the future, Pessanelli (1993) speculated that technologies would allow learning to take place virtually everywhere. Essentially, the success or failure of distance education rests on the enthusiasm with which these new technologies are embraced by the faculty (Willis, 1994). Therefore, faculty play an important role in the implementation of distance education and technological change. However, research on faculty involvement in distance education is lacking in quality and quantity (Dillon & Walsh, 1992).
Distance education is changing the way education is being delivered (Gilbert, 1996). Therefore, faculty members are essential to the growth of distance education and should be involved in the entire distance education process (Yong & Wang, 1996). Some studies revealed that institutions needed to: (a) provide training through faculty development programs (Daigle & Jarmon, 1996; Moskal, Martin & Foshee, 1997; Sherry, 1996; Warren, 1997); (b) provide faculty support — both technical (Sedlak & Cartwright, 1997; IDE, 1995; Diamond, 1993) and administrative (Gilbert, 1996; Willis, 1994); (c) reevaluate current incentive and reward structures (Brownlee, 1997; Diamond, 1993; NCSU, 1997; Olcott & Wright, 1995; Wolcott, 1997); and, (d) reevaluate current tenure and promotion policies as they relate to distance education (Olcott & Wright, 1995; UMUC, 1996; Wolcott, 1997).

Dickey and Davis (1998) maintained that one of the most important resources in a college or university was the faculty, and in order to meet the goals of the university, faculty input was essential.

The Use of Web-Based Technology

According to Pajo and Wallace (2001), the growth of the World Wide Web (the Web), combined with rapid technological advances in computing power, has paved the way for web-based distance learning. The use of the Web for delivery of distance courses is a major development that is changing the way knowledge is imparted to the widest audience inside and outside the classroom. The technological innovations are profoundly influencing university practices and policies and may even be fundamentally altering the conceptualizations about education. Many reasons have been suggested as to why universities and other teaching institutions should introduce web-based instruction.
The three most commonly advanced rationales for incorporating web-based technology into distance education were to enhance the quality of learning, to maintain competitive advantage, and to improve access to education and training (Bates, 1997; Inglis, 1999; Oliver, 1999). The introduction of web-based instruction offers the promise of enhancing the learning experience of distance education students in several ways. Those who endorse a constructivist or collaborative approach to teaching and learning believe that facilitating real interaction between students, or between students and instructor, is the most important mechanism by which web-based instruction can enhance the learning experience (Daugherty & Funke, 1998; Inglis, 1999; Kirkwood, 1998; Oliver, 1999).

Other studies have highlighted the capacity of information and communication technologies to build student motivation, to engage students, and to develop self-directed and autonomous learning (Akerlind & Trevitt, 1999; Daugherty & Funke, 1998). Incidentally, computer-assisted instruction has been shown to improve learning outcomes for students (Fletcher-Flinn & Gravett, 1995; Ryan, 1991). Moreover, the quality of the learning experience for distance students is also thought to be enhanced by the greater range of presentation forms available and the interactivity with the material.

The new web-based technologies also provide ready access to the latest information and experts around the world. Therefore, faculty and students can use the Web to access up-to-date and pertinent material. The new web-based technologies help ensure that the learning experience will be most relevant and useful to the student in a dynamic environment where knowledge is at a premium (Pajo & Wallace, 2001).
For many educational institutions, the adoption of web-based instruction may be driven not so much by pedagogical imperatives, but business concerns. Bates (1997) suggested that the new web-based technologies might be perceived by some institutions as a convenient replacement for labor, thereby reducing the costs of education. Bates (1997) goes on to warn, however, that the materials and the new technologies by which they were delivered can only partly substitute for the interaction between a learner and a real teacher. If technological systems are used to reduce labor costs, then the use of materials and the new technologies may ultimately be at the expense of quality of learning. Arguments that stress cost savings achieved by increasing learner reliance on self-instructional materials and reducing teacher-student contact may in the end be incompatible with those that emphasize gains in learning outcomes or improvements in quality (Inglis, 1999).

Furthermore, the economic rationale also relies largely on the notion of economies of scale. Educational institutions may hope that by moving to web-based delivery they can target a much larger market, attract more students, increase student intakes into courses, and thereby reduce the cost of teaching each student (Kirkwood, 1998). Savings may also be anticipated by eliminating printing and mailing costs. However, cost savings may not be as great as some organizations anticipate.

Overhead associated with communication and infrastructure requirements, the development of materials, and the provision of ongoing support for staff and students may make it a more costly proposition than expected (James & Beattie, 1996). Moving
to web-based delivery has been borne out in a recent study in which it was estimated that changing from conventional correspondence-based approaches to web-based delivery would in fact increase costs (Inglis, 1999).

However, even if it should prove to be more costly than anticipated, there may be good strategic reasons to shift to web-based delivery (Inglis, 1999). For many educational institutions, a shift to web-based delivery may provide opportunities to develop an international presence or allow them to capitalize on expanding local markets and increasing student demand. Furthermore, Inglis (1999) argued that although the move to web-based delivery cannot be fully justified by cost savings alone at present, educational institutions need to gain experience and position themselves to take advantage of these new distance education systems. In a climate where universities are experiencing greater fiscal constraints and increasing competition from other national and international providers, universities, which fail to move to web-based delivery, may not survive.

Fabry and Higgs (1997) wrote about the discrepancy that existed between the level of technology use expected of educators and the actual use and integration of technology in the classroom. Although much has been written about the value of computers for learning, the successful integration of technology into the tertiary student's course depends not only on access and availability, but also on how faculty embrace and use technology. A number of reasons account for the gap between actual and expected use of computers. Some of the barriers to effective use of technology include faculty attitudes and resistance to change, concerns about funding, training deficiencies, inadequate access, time constraints, and lack of technical support.
In a 1995 study of postgraduate education in Australia, James and Beattie (1996) revealed a slow uptake of flexible delivery options, with print remaining the dominant medium of instruction. Factors found to be inhibiting widespread implementation included concerns over academic standards, the adverse impact on other academic work (particularly on research and writing), and the absence of adequate support (James & Beattie, 1996). Factors inhibiting widespread implementation of effective use of technology are recurring themes that have been identified by researchers in other countries (Daugherty & Funke, 1998; Hare & McCartan, 1996; Thompson & Holt, 1996).

Developments in communication and information technology and in web-based instruction continue unabated. Although new technologies offer great promise, important issues need to be considered if effective web-based instruction is to be realized. Effective use of technology would be helpful for institutions that hope to take advantage of these developments to know what experience their faculty currently have, what their attitudes toward web-based technology are, and what they perceive to be the major barriers to the implementation of this technology (Pajo & Wallace, 2001).

Furthermore, although several studies have explored barriers to the uptake of web-based teaching initiatives, there has been no attempt to quantify the impact of these barriers or to explore how barriers might influence different outcomes associated with the adoption of new technology.

Faculty Use of Electronic Technologies

The use of electronic technologies in the classroom has great potential to contribute to the improvement of instructional programs (Liao, 1998; McCaslin & Torres, 1992; Papert, 1995; The Wall Street Journal, 1997). In addition, electronic technology can be used in the
form of computer-supported teaching and learning applications classified as experiencing, informing, reinforcing, integrating, and utilizing (Thomas & Boysen, 1984). Other forms of electronic technology for the classroom are the use of slide presentations and the Internet. Other forms include the use of electronic devices for delivering class materials or consultations using the Internet, fax, or telephone. Research (Day, Raven & Newmart 1996; Goldberg, 1997; Liao, 1998; Nooriafshar, 1998) and teaching experiences (Harris, 1992; Schumacher & Strickland, 1992) showed that the incorporation of multimedia instruction in the classroom enhanced students' understanding and achievement levels, improved students' attitudes toward learning, helped students sustain interest in the materials, and did not harm students' attitudes toward computers, the Internet, and learning.

In a meta-analysis of 35 studies, it was found that the effects of using hypermedia in instruction were positive when compared to conventional instructional methods (Liao, 1998). The adoption of hypermedia in education was recommended by Nordheim and Connors (1997) since hypermedia incorporation could help students gain valuable skills needed for a career.

Despite the existence of consistent research providing evidence of the benefits of integrating technology in the classroom, integration has not reached its full instructional potential (Thomas & Boysen, 1984). Furthermore, Osborne (1992) stated that agricultural educators mostly used computers for managing instruction rather than for teaching.
Moreover, Birkenholz (1992) reported that even though 73 percent of all agriculture programs in the United States had access to computers, this access did not lead automatically to the use in teaching. The computer has been used "as a teaching device rather than a learning device" (Thomas & Boysen, 1984, p. 15). Moreover, instructors' beliefs that they need instruction and more experience to teach with computers was reported in several research studies (Birkenholz, 1992; Bulkeley, 1997; Nordheim & Connors, 1997).

Nordheim and Connors (1997) analyzed the actual uses of computers in the classroom, once availability was provided. Nordheim and Connors’ study population were agricultural education instructors in the northwest United States. Furthermore, Nordheim and Connors found that word processors were the most widely used computer software, followed by graphics presentation programs and spreadsheets. Instructors were found to agree that using computers in their instructional program was very beneficial for them and their students. However, instructors also reported that they had limited experience with using computers as instructional tools.

Nordheim and Connors’ findings were consistent with other reports that instructors perceived to be ill prepared to use computers in the classroom (Bulkeley, 1997). In fact, most educators were unprepared to use computers as a teaching tool. It was estimated that nearly one half of the teachers in the United States had little computer training or experience, and only 13% of school systems mandated computer training (Bulkeley, 1997). Even those teachers who had experience “have never been taught how
to teach with them" (Bulkeley, 1997, p. 4). Another study (Faseyitan & Hirschbuhl, 1992) focused on the effects of personal factors on college professors' adoption of computers in the classroom.

Faseyitan and Hirschbuhl, (1992) found significant differences between adopters and non-adopters. Adopters had a positive attitude toward computers, their disciplines were more technology-oriented, and adopters generally had computer skills. Similar findings regarding technical orientation and computer adoption among Cornell University faculty were reported by Yarbrough (1986), Masiclat (1992), and Wu (1996). Therefore, college professors' tended to use the computers for instructional activities.

In summary, the use of information technology at the university level is increasingly common; e-mail addresses appear on syllabi, e-mail is sometimes offered as an addition or an alternative to office hours; commercial software or faculty-designed software all be part of required resources; class sessions might be held in computer labs; and assignments and projects may involve the use of the Internet and the World Wide Web (the Web). In addition, many syllabi require students to present project information using multimedia programs, including the use of digitized images and sound (Green, 1996). All the factors mentioned above contribute to the knowledge that information technology is an accepted and important part of the university classroom. Therefore, faculty perceptions toward information technology and the use of these technologies to deliver distance education are increasingly relevant and important.
Level of Importance (Value of Technology Use for Teaching)

In order for faculty to use available information technology for personal use, distance education, and in classroom instruction, it is important for them to have both knowledge of, and access to, information technology in training courses. Studies have shown that a lack of training has had the largest effect on faculty attitudes toward the integration and use of information technology (Coffis, 1988). For example, teacher education faculties at the University of Houston were surveyed following training sessions (Willis, Willis, Austin & Colon, 1995). The result indicated that 76 percent of the respondents said that information technology was "Very Important to Extremely Important". Willis et al. (1995) found that faculty attitudes at the Houston institution were relatively positive toward the perceived importance of information technology after being exposed to information technology training (Willis, Willis, Austin & Colon, 1995).

Faculty Level of Competence/Skills and Abilities in the Use of Technology

One of the first studies incorporating telecommunications and the Internet was at the California State University System. Shifflet (1993) determined that faculty members were quite skilled at using a computer for simple tasks such as the use of a word processor and spreadsheets. However, it was ascertained that only 14 percent of faculty used computers to communicate with colleagues, and only 15 percent accessed networks or the Internet. Other faculty needs most frequently identified by Shifflet included: release time to further develop computing skills; funds to attend computing workshops; and, a computer in their offices.
Limin (1997) conducted a computing need analysis of 209 College of Education faculty members at the University of Tennessee. Limin determined that word processing and e-mail competencies were ranked the highest with regard to both importance and knowledge/skills, but low concerning the need for training. Although Limin (1997) and Roopnarine-Maedke (1989) found faculty competent in word processing, competency in word processing or use of presentation packages was not enough for online teaching. Moreover, Ritchie and Hoffman (1997) observed that a Web publication appeared to be merely an extension of word processing: “a technical skill, which, we should remember, we have come to regard as a “baseline” skill for faculty only in the past decade, if at all.” (p. 2).

Additionally, one research study (Limin, 1997) has shown that faculty members in technology and engineering departments generally possessed better computer skills than those in the social science and the humanities. Therefore, more support may be necessary in the non-technical areas (Limin, 1997). Lynch and Corry (1998) stated that the best technique for learning to use distance education technologies was practice. Skill development evolved over time in real life situations. Furthermore, faculty with well-developed skills, experience, and motivation will work with confidence and effectively represent the institution (Lynch & Corry, 1998).

In addition, the literature (Simerly, 1990) strongly suggested that educational institutions and their faculties must develop and more effectively use teaching skills in order to remain scientifically and technically up-to-date in contemporary society. Simerly (1990) found that college of agriculture faculty were interested in gaining new knowledge and skills which would enable them to be more effective in teaching,
research, and community service. Moreover, Galusha (1997) found that faculty might lack the basic skills or hardware to fully participate in distance education. Cho and Berge (2002) agreed that some individuals were threatened by technological changes, and increased use of technology.

Technological changes have caused changes in the competency requirements for the labor force. Some instructors are concerned they will be replaced by technology mediated learning products or those they will not be able to perform adequately in the technology-enhanced classroom or in distance education (DE). Thus, some resistance comes from technological change concerns. Providing instructor training in DE technology and teaching methods, especially before an instructor teaches a DE course for the first time, can reduce the instructor's fears.

Availability of Equipment and Facilities

Another aspect related to faculty participation in distance education is the availability of the equipment and facilities to deliver distance instruction. In a study, Wetzel (1993) identified lack of knowledge about software, time constraints, and limited recognition of information technology's potential as obstacles to effectively integrating technology into classrooms. For many faculty members, information technology experiences have been negative. Willis (1993) argued that hardware and software were no longer the most important issues; the most important topics were instructional strategies. Learning to recognize instructionally appropriate software and cyclical training and support were other key issues.
If information technology is to become a tool of choice for learning and information, faculty must learn to model its use to students, and mentoring has been found to be an effective way to encourage faculty to begin integrating information technology (Gonzales & Hill, 1997). Another important concern is the decrease in the availability of hardware and software to both students and faculty.

Lack of software and equipment was one of the main complaints of faculty in previous studies (Wetzel, 1993). At the time of Wetzel's study, equipment security, lack of presentation programs, suitable software, and student ability to access equipment after class were all issues that needed to be addressed. Since 1993, most universities have continued to make necessary information technology upgrades and have provided students and faculty with hardware and software necessary to perform basic functions (word processing, electronic mail, etc.).

Galusha (1997) affirmed that the advent of computers, telecommunications, and the World Wide Web provided an unprecedented opportunity for faculty and students to learn in a cooperative environment. Galusha stated that students respond to a cooperative changing environment more adeptly than faculty. At California State University, for example, more than 50 percent of the student body owns home computers, while less than 50 percent of the faculty own a home computer (Syllabus Magazine, 1996). Obtaining proper equipment and training is critical in faculty acceptance of distance learning. In addition, Berge and Muilenburg (2001) stated that technology-enhanced classrooms or laboratories and the infrastructure required by faculty may not be available and considered another deterrent in faculty participation in distance education.
Faculty Participation in Agriculture Distance Education Programs

According to the Appalachian Regional Commission (1992), 95 percent of all learning institutions were to use distance learning to provide educational services by 1995. Many agricultural institutions and organizations have already developed and delivered distance education programs and courses using telecommunications technology. Jackson (1993) reported that The Agricultural Satellite Corporation (AG*SAT) was a consortium of 42 land-grant universities established to conduct an agricultural information and instructional service through advanced telecommunications (AG*SAT, 1990). According to Jackson (1993), the AG*SAT transmitted agricultural programs across university and community settings using satellites and other technologies. Most participating universities in AG*SAT listed satellite courses as part of their curricula. Furthermore, AG*SAT instructors were considered visiting professors at each university where their courses were down linked (Benedetti, 1992).

Moreover, in the spring of 1992, AG*SAT offered seven college credit courses: Agricultural Marketing from the University of Nebraska; Agricultural Ethics from Texas A & M University; Cereal Science from Kansas State University; Introduction to Food Science from The Pennsylvania State University; Methods in Teaching Agriculture from The Ohio State University; Municipal Solid Waste Management from Clemson University; and Professional Agricultural Selling from Purdue University (Jackson, 1993).

However, most of AG*SAT’s televised instruction consisted of extension programming through federal, state, and county level Cooperative Extension organizations. According to Jackson (1993), AG*SAT’s major contributions have been
to broadcast televised courses and programs, broaden the agricultural curricula, and to provide educational materials that would otherwise not be available. Many of the educational programs were delivered by college of agricultural sciences faculty and county extension agents.

Jackson (1993) reported that Bretz (1992), assistant director and program manager of AG*SAT, indicated that more instructional hours and faculty were needed to produce additional agricultural distance education programs to be delivered on the AG*SAT network. Apps (1991) indicated that colleges of agricultural sciences should produce and deliver quality distance education programs because the American public has become concerned with "time, place, and money." Apps noted that many adults who were continuing their education indicated that quality agricultural courses and programs could be downlinked to them near their homes and workplaces through distance education. Apps (1991) concluded that the student's philosophy was changing because of rising tuition costs and the advances being made in distance education technology.

According to Jackson (1993), Apps (1991), Moore (1991), and Dillon (1989), telecommunications courses and programs have been increasing in popularity. However, despite the public's perceptions and telecommunications' growing popularity, Brock (1987, p. 40) stated that "negative faculty attitudes, ranging from apathy to open antagonism, remains a major barrier" to effective distance education programming.

Schmidt and Faulkner (1989) indicated a need for professional teacher development in distance education because the instructional planning and delivery of telecommunications courses and programs required changes in teaching methods. Moreover, Peters (1983) and Holmberg (1986) indicated that distance education
programming was a sophisticated and complex phenomenon that had altered the teaching roles of higher education faculty. According to Grossman (1987), faculty must become involved in the developmental process of distance education. However, faculty participation will continue to be limited because of the lack of incentives, poor attitudes toward distance education, suspicions of the nontraditional, threats to the traditional, and required changes in instructional methods (Dillon, 1989).

The potential of providing agricultural instruction through distance education programming is tremendous. Many educational institutions are taking advantage of telecommunications technology by developing and delivering distance education conferences, workshops, courses, and programs. The increasing availability of telecommunications within educational settings has also provided faculty in colleges of agricultural sciences with unique opportunities to plan and deliver courses and programs at a distance. However, agricultural distance education will not reach its potential until faculties are as ready as the technology (Newcomb, 1992). Faculty must learn to plan and deliver instruction differently, using a variety of methods and techniques.

There is also limited research on the instructional context of agricultural distance education courses and programs. Few studies have examined the methods and techniques required to successfully deliver agricultural distance learning in spite of the barriers that often affect adoption and delivery. The literature also supported the need to identify barriers that college of agricultural sciences faculty will encounter when involved in distance learning. Likewise, faculty must be encouraged to participate through incentives inherent in distance education instruction.
The search for identifying variables which influence educators' adoption of web-based technology for distance education has been a common concern in research (Beal, 1981; Birkenholz, 1992; Faseyitan & Hirschbuhl, 1992; Faseyitan, Libii, & Hirschbuhl, 1996; Masiclat, 1992; Wu, 1996; Yarbrough, 1986). Furthermore, in a study conducted among Australian higher education instructors (Adam & Wilson, 1996), it was found that educators adopted information technology for their own professional activities earlier than the broader community. However, educators were not ready to use these technologies in future teaching.

Incidentally, Murphy and Terry (1998) conducted a study to develop a consensus document to provide focus and direction for future research activities concerning the adoption of electronic communication, information, and imaging technologies for instructional use in agricultural education settings. Murphy and Terry (1998) reported that panelists achieved consensus on 13 obstacles to be overcome in the process of adopting these technologies. These obstacles tended to cluster around five areas: (a) lack of time; (b) lack of a formalized reward system for faculty; (c) lack of technical support; (4) cost of the equipment; and, (5) lack of properly designed facilities.

Murphy and Terry (1995) developed a study, whose main purpose was to provide baseline data and focus for the improvement of instruction in a college of agriculture through the utilization of electronic technologies used in teaching. The population used for the study was all teaching faculty in the college of agriculture at a land grant university. The instrument used to collect data was a three-part questionnaire designed by the researchers to measure the following: (a) the level of competence of faculty members in the utilization of technologies associated with distance education; (b) the
perceived value technologies have or will have to the teaching of agriculture; and, (c) the perceived availability of equipment, facilities, and training related to the use of technologies.

Murphy and Terry (1995) reported that faculty were generally negative concerning their competence in producing instructional materials and using appropriate teaching methodologies for distance education. Nearly half of the respondents indicated they were not involved in creating multimedia instructional materials for their courses. Moreover, slightly more than 52 percent indicated they could not teach others how to use presentation graphics software, and 71.1 percent stated they did not produce their own color overhead transparencies. In addition, when asked if they were familiar with teaching methodologies used in teaching courses over distance, 44.6 percent of the respondents disagreed or strongly disagreed and 12.4 percent agreed or strongly agreed. Less than 20 percent indicated they could confidently deliver their course over distance, while 34.6 percent indicated they could not.

Moreover, when Murphy and Terry (1995) asked faculty about the importance about electronic technologies has for teaching, faculty considered the use of electronic technologies to enhance their teaching to be useful and important. In addition, faculty believed development and use of electronic teaching technologies would change how they teach, but would not change what they teach. Moreover, faculty agreed that electronic teaching technologies contributed to teaching graduate and undergraduate courses; however, there was a need for face-to-face interaction between teacher and student (Murphy & Terry, 1995). For the variable of availability of infrastructure, the
Murphy and Terry (1995) study indicated that the teaching faculty in the college of agriculture considered their access to be limited to equipment and facilities needed to develop and use electronic teaching technologies. Moreover, Murphy and Terry (1995) reported that the teaching faculty in the college of agriculture considered their access to be limited to training and assistance needed to develop and use electronic teaching technologies. In addition, faculty did not believe time and effort expended to develop multimedia course materials was appropriately valued in their departments (Murphy & Terry, 1995).

In a five-year longitudinal examination of faculty needs associated with agricultural distance education study, Murphy and Dooley (2001) found that faculty members perceived that they had gained competence in technological skills. However, faculty members were less certain of their abilities to use appropriate teaching methods used for delivering distance education. Murphy and Dooley's study found that teaching faculty in the college of agriculture considered the use of electronic technologies to enhance their teaching to be useful and important. Additionally, teaching faculty members perceived training and assistance in the use of instructional technologies to be less available than equipment.

According to Murphy and Dooley (2001), faculty were philosophically opposed to the idea of using technologies in teaching, with a strong belief that teaching must occur thorough one-on-one contact. Although rewards and incentives were considered important, it appeared as if the belief that technology would not be an effective teaching\learning tool took precedence over the consideration for reward or incentives to
promote faculty use of technology. Murphy and Dooley (2001) concluded that faculty did not see an apparent audience base for instruction using technology and therefore did not perceive the time and effort in technology integration to be worth the effort.

**Faculty Resistance**

Advances in the use of telecommunication technologies have led to increased interest in distance education programs in postsecondary education (Dillon & Walsh, 1992; DeLoughery, 1995). However, the rate of adoption on college and university campuses is still quite low (Gunawardena, 1990; Heinich, 1984; McNeil 1990). In particular, many studies cited faculty resistance to instructional technology as a primary barrier to the continued growth of distance education (Gunawardena, 1990; McNeil 1990; Stinehart 1988).

Faculty resistance to distance education is multifaceted. Research (Clark, 1993; Dillon & Walsh, 1992; Gilbert, 1996; Olcott & Wright, 1995; Sherry, 1995; Verduin & Clark, 1991) indicated that faculty resistance was linked to institutional barriers including: increased workload; lack of time; lack of skills or knowledge; lack of access to relevant technology; lack of incentives; fears of reduced student interaction; and, fragmented support services. Furthermore, institutional barriers were often embedded within institutional policies and deterred faculty from participating in distance education. According to Parisot (1997), “Institutions need to address the barriers that impede the adoption and use of distance technologies by faculty and build policy that encourages openness to new teaching methods, as well as changes in a college's organizational and administrative structure” (p. 12).
Distance education programs and traditional education programs share many similarities. However, according to Sparkes (1984), there were two major differences between the two programs: (a) student enrollment; and, (b) instructional methods. Research in distance education (Dunham, Miller, Rubinyi, & Shaffer, 1996; Jacobson, 1994; Moore & Kearsley, 1996; Sparkes, 1984; Verduin & Clark, 1991) has indicated that student enrollment and instructional methods can greatly affect faculty workload.

The number of students enrolled in a single distance education course can greatly outnumber students enrolled in traditional education courses (Dunham, Miller, Rubinyi, & Shaffer, 1996; Jacobson, 1994; Moore & Kearsley, 1996; Sparkes, 1984; Verduin & Clark, 1991). In addition, instructional methods in effective distance education programs require extra time for training, extensive instructional planning, assembling course content, understanding the needs of students, the adaptation of traditional teaching strategies to a new learning environment, and student-teacher interactivity (Bates, 1984; Gottschalk, 1997; Moore & Kearsley, 1996; Sherry, 1996; Verduin & Clark, 1991).

Dunham, Miller, Rubinyi and Shaffer, (1996) indicated that the most common barriers to the adoption of new technologies included insufficient time to learn how to use technologies, insufficient skill, and little or no access to training or technical assistance, lack of compelling reasons or need to use new technologies, personal incompatibility, and cultural incompatibility (Dunham et al. 1996). Personal compatibility included a lack of motivation to learn new technologies and fear of learning new technologies because of inexperience. Cultural incompatibility, as defined by Dunham, Miller, Rubinyi and Shaffer, (1996), included environmental issues such as outdated equipment, equipment sharing, slow Internet connections, and limited or no training and limited technical
support for users. The identification of institutional barriers was critical in the
development of distance education policies (IDE, 1995) because institutional barriers
could ultimately discourage faculty participation and the adoption of distance education
altogether (Olcott & Wright, 1995).

In defining institutional barriers, administrators need to examine established
organizational and training support structures for both early adopters and mainstream
faculty (Dunham et al., 1996). Ultimately, the identification of institutional barriers is the
first step in decreasing faculty resistance to participation in distance education.
According to Weber (1984), while advances in technologies contributed to the increased
numbers of telecommunications courses and programs, faculty were often unprepared to
teach such courses and programs. Furthermore, Weber identified six weaknesses that
instructors faced in providing telecommunications instruction: (a) lack of continuing
contact with the student; (b) the facilitation of student drop-out; (c) courses lack
substance; (d) little or no feedback; (e) timing; and, (f) scheduling examinations.

In addition, Jackson (1993) indicated that many faculty members in colleges of
agricultural sciences would not become involved in distance education programming
because they feared teaching on camera. Faculty resistance has also been a major barrier
in distance education because there was a fear that telecommunication systems could lead
to the elimination of some faculty positions or that faculty may have to relinquish some
control over the teaching and learning process (Gunawardena, 1990).
Barriers for Faculty Participation on Web-based Distance Education

In an editorial published in 1994, in *The American Journal of Distance Education*, the Editor and one of the world's foremost distance education researchers, Dr. Michael G. Moore speculated that:

... the barriers impeding the development of distance education are not technological, nor even pedagogical. We have plenty of technology, and we have a fair knowledge about how to use it. The major problems are associated with the organizational change, change of faculty roles, and change in administrative structures. Here we desperately need all the ideas and all the leadership than can be assembled. The starting point is to expose the problems (Moore, 1994, p. 4).

In the years leading up to and following Moore's statement, there has been a substantial amount written which identified the problems addressed by Moore. Hundreds of articles have been published which identify and discuss barriers to distance education. Those articles were either research reports on the barriers to distance education, or they shared with the reader anecdotal experiences, lessons-learned, and, problems and issues educators (or students) faced when teaching and learning at a distance (Berge & Muilenburg, 2001).

Furthermore, Thompson (1997) stated that distance-learning (DL) faculty members had articulated many barriers, or reasons for resistance, to instructing in a DL format. The barriers included several different areas. The barriers included the issues of support, time requirements, faculty training, compensation, rewards, fear of loss of employment, and embarrassment when using the new technologies (Thompson, 1997).

Pajo and Wallace (2001) maintained that the growth in computer applications and use of the Internet in particular, had signaled change for the delivery of distance teaching. Pajo and Wallace conducted a survey at Massey University and reported the findings.
from staff responses in the Colleges of Business, Science, and Education about their current use of web-based technology in distance teaching, future intentions to use such technology, and major barriers to the uptake of the technology. Pajo and Wallace (2001) affirmed that the web-based technologies most commonly used by staff for teaching purposes were e-mail contact with students and accessing the library databases.

Additionally, respondents identified numerous advantages associated with web-based learning approaches, but most did not believe web-based technology was any more effective than conventional correspondence-based distance learning. The chief barriers identified were the time required in learning how to use web-based technology and develop appropriate courses, the lack of training, and the continuing time requirements associated with using and monitoring web-based technology in teaching.

Institutional Support

The support that is requested by distance learning (DL) faculty members is expected to come from the institution, the department, and fellow faculty members. Institutional support also included the need for administrative leadership in advancing the importance and benefits of DL programs. The institution can champion DL programs with administrative leadership in the funding, and promotion and recognition of DL programs. In addition, cooperation and support from the administration are mandatory to meet the institution's mission goals and objectives (Thompson, 1997).

According to Gilbert (1996), faculty need support to make the most effective use of new approaches to teaching and new applications of technology. Faculty support combines both administrative and technical support. In an environment, which supports faculty innovation, Willis (1993) recommended that academic administrators work
closely with technical managers to establish technical standards and procedures which accommodate faculty schedules and various teaching styles. Willis (1993) also recommended providing faculty with answers to technical, administrative, and academic questions in a language which was understood by faculty.

As part of the environment, which supports faculty innovation, Sherry (1996) suggested providing faculty with opportunities to communicate with other faculty who had gone through the same process. Essentially, faculty support should be structured to accommodate the needs, concerns, and technical abilities of all faculty members, regardless of technical experience, in order to best nurture newly learned skills and teaching strategies (Gilbert, 1996; Willis, 1994). Furthermore, previous studies clearly suggested that academic departments integrate distance teaching into on-going unit budget policies and promotion, tenure, and merit policies (Dillon, 1989; Gunawardena, 1990; Kirby & Garrison, 1989).

Given the increasing importance of faculty roles, it is likely that departmental and divisional chairpersons will be the most influential advocates of distance teaching as a valued endeavor that is supported and rewarded at a level commensurate with traditional instructional activities (Clark, 1993). Moreover, the aggregate effect of the institutionally embedded disincentives is that they deter faculty participation and adoption of distance teaching. However, other issues create additional barriers. Other barriers include increased workload, lack of time, reduced student interaction, less spontaneity, and technical and administrative problems such as poor audio quality and distribution of course materials (Clark, 1993; Dillon & Walsh, 1992).
According to Berge and Muilenburg (2001), administrative structure and organizational change were important issues that needed to be considered simultaneously. Several case studies pointed out the importance of the organizational culture or norms, paired with administrative structure, when an organization implemented, or planned to implement distance education (DE) (Berge, 2001a; Bunn, 2001; Crow & Rariden, 1993; Keast, 1997; Moore, 1997; Olcott & Wright, 1995; Shrivastava & Souder, 1987). In addition, Cho and Berge (2002) stated that the technical infrastructure and technical support were closely linked with other barriers such as user access, student support, social interaction, and quality of learning. It appears that when there is strong support from upper administration, aligned with organizational norms and culture favorable to DE, other barriers will be minimized or reduced in intensity.

Furthermore, Berge and Muilenburg (2001) concluded that evidence from responses to their survey indicated that there was a relationship between an organization's level of capability in distance education and the barriers to distance education reported by respondents for some, but not all barriers. Separately, Berge and Muilenburg found evidence to support Professor Moore's assertions that barriers associated with "organizational change" were more critical than "social interaction and quality concerns," "technical expertise," and "threatened by technology."

Berge and Muilenburg did not find support that "administrative structure" was more critical than "organizational change" factors. Moreover, responses to Berge and Muilenburg's (2001) survey supported the proposition that educators perceived fewer or less intense barriers in organizations that were more capable for delivering distance
education. Galusha (1997) stated that lack of support for distance learning, in general, provided inadequate faculty selection for distance learning courses. Furthermore, organizational problems, especially infrastructure and technology problems, also presented challenges. Faculty members who teach distance education courses need organizational and administrative support from the institution. Funding should be provided to create an administrative unit that is to be responsible for managing the program. Institutional leaders must be committed to distance programs (Galusha, 1997).

In addition, Marrs (1995) agreed when he stated that, "Without this support, distance education is at risk of becoming a peripheral activity, without commitment from or significance to the institution" (p. 21).

Time Requirements

One of the most often mentioned concerns by distance learning (DL) faculty was that instructing in a DL environment puts very high demands on the time of the faculty member. The literature and practicing faculty members cited numerous examples of this problem (Brooks, 1999). A common theme with the time issue was that DL classes demanded much more time and effort in course planning, activities required before the course was offered, more preparation time for each class session, and additional class maintenance time to send course materials to the remote sites, provide fast turnaround of student work, to respond to student e-mails, and more (Brooks, 1999). Concerns were increased when the administration did not recognize or appreciate the extra efforts to provide a successful DL experience for the students (Gosmire, 1995; Stratford, 1996).
According to Ritchie and Hoffinan (1997), few faculty members used the Internet for course delivery. However, universities continue to hire faculty primarily for their content expertise, to the exclusion of other skills such as Internet use. The time necessary to learn skills, such as hypertext markup language (HTML), prevents many faculty members from attempts to publish course materials on-line. Burnham (1988) found that faculty were positively motivated towards a Utah State University telecommunications project. Utah State faculty members reported that they were generally pleased with the telecommunications system's capacity to facilitate discussions, convey humor, and augment direct learning during the instruction. Faculty participating in the Utah study also indicated that more instructional preparation time was required to provide highly structured learning experiences which compensated for the differences in time and physical separation (Burnham, 1988).

According to Berge and Muilenburg (2001), distance learning courses required a greater time commitment, therefore additional faculty compensation, incentives, and release time were important issues.

Faculty Training

"Faculty training is critical to the success of any distance education program" (Willis, 1993, p. 277). Therefore, training should be strategically planned and integrated within an entire institution. Moreover, faculty training was an important area identified by prior research as a critical factor in a distance learning setting (Huston, 1997; Stratford, 1996; Willis, 1994). Downs (1997) noted that one of the immediate issues faculty must confront in a non-traditional classroom was the use of technology.
Therefore, distance-learning systems present challenges and considerations regarding methods of instruction that were not present in the traditional classroom setting. Researchers have recognized that faculty members needed to receive training to prepare them for using the distance learning (DL) system to deliver their courses (Brooks, 1999). Some faculty members, especially those less technologically competent, fear embarrassment at trying to teach in the more complex DL environment. Training can be used to develop new skills and abilities for DL instructors in order to reduce those fears in a distance-learning environment (Northrup, 1997).

Furthermore, distance learning requires different skills, such as understanding how to properly use the technology and relate it to their instructional delivery. Additionally, training is an area where the administration can offer significant support for the faculty and the distance learning programs at their institution (Siantz & Pugh, 1994). Regarding training, Bowen and Thompson (1995b) studied agricultural sciences department chairs’ perceptions of the need for distance education.

Bowen and Thompson (1995) found that of 277 respondents in 42 different (mostly) land grant institutions in the United States, 70% of them believed that faculty needed training in delivering courses at a distance. The Bowen and Thompson results were consistent with the Murphy and Terry (1995) findings and recommendations. In addition, Bowen and Thompson (1995) found that faculty perceived themselves as having limited competence in the use of electronic technology and teaching methodologies to deliver courses at a distance. Faculty also perceived themselves to have limited access to
training, technical assistance, equipment, and facilities. Bowen and Thompson established a need for the development of training programs to help professors become proficient in delivering courses at a distance.

Likewise, Miller and Carr (1997) conducted a study to identify the information and training needs of agricultural professors related to distance education. Professors were asked to rank 22 topics related to distance education. Miller and Carr (1997) found that for faculty in 1862 land-grant universities, the top five highest rated topics were: (a) teaching techniques for distance education; (b) enhancing interaction in distance education; (c) learner centered teaching techniques; (d) designing instruction for credit courses; and, (e) models of effective distance teaching. However, in practice, individuals with previous experience in delivering presentations, but no previous experience in delivering at a distance, were with the help of site facilitators, also capable of reaching an effective level of proficiency when using interactive video equipment (Kennedy & Agnew, 1998).

In a study conducted by Gressard and Loyd (1986), it was found that elementary school teachers who had received computer training were significantly less anxious and more confident about computer use after training than before training. Results of many other studies have shown that training has a positive impact on some, if not on all, aspects of the subjects' self-perception of knowledge, confidence, and attitudes toward computers (Green & Kluever 1993). Additionally, in a study by Jacobson and Weller (1988), 96% of the faculty at the University of Illinois, Urbana, were interested in using computers, however, 60 percent considered lack of training an obstacle. Staman (1990) believed that a lack of awareness of information technology potential and successful examples of how
to use information technology in different disciplines contributed to faculty's unwillingness to integrate information technology into the classroom. Moreover, Galusha (1997) acknowledged that computers, video equipment, communications software, and the like, presented challenges and frustrations.

Therefore, faculty must know how to use computers, video equipment, and communications software technologies if they are to teach distance courses. Training faculty, particularly in troubleshooting problems, is imperative to success in technical distance learning (Galusha, 2002). Likewise, Dickinson, Agnew, and Gorman (1999) conducted a study about faculty training and compensation in distance education. Furthermore, Dickinson, Agnew, and Gorman (1999) concluded that faculty surveyed indicated that the ability to hold class discussions was the single most prevailing weakness they had encountered in meeting the students' needs in the distance learning classroom.

In addition, Dickinson, Agnew, and Gorman (1999) indicated that testing and the ability to give feedback to students were continuing concerns. More than 90 percent of the respondents indicated that substantially more preparation time was needed to teach distance or multiple sites adequately (Dickinson, Agnew, & Gorman 1999). Furthermore, Dickinson, Agnew, and Gorman (1999) declared that 75 percent of the respondents had no additional training or professional development opportunities related to distance education, other than an introductory session on how to use the equipment. More than 88 percent of the respondents indicated they received neither extra compensation nor a reduced workload for developing and/or teaching distance courses (Dickinson, Agnew, & Gorman, 1999).
Moreover, the Dickinson, Agnew, and Gorman (1999) findings suggested the need for more training for faculty members who were expected to teach distance education courses as well as more opportunities to develop more effective instructional designs because of the time requirements for class preparation and the instructors’ inability to use many of the teaching strategies perfected in the traditional classroom.

In addition, the Dickinson, Agnew, and Gorman findings indicated a need to investigate how increasing numbers of students would impact the research and service roles expected for faculty and to help determine if tenure and retention criteria needed to be re-evaluated to reflect the increased demands of teaching distance education. Finally, results from that study (Dickinson, Agnew, & Gorman, 1999) suggested that effective faculty training would increase mutual understanding of both faculty and institutional educational objectives. Lastly, even when training needs appeared to be obvious, it was still necessary to analyze the specific knowledge and skill requirements in order to choose appropriate methods of training that would meet the training needs (Bartram & Gibson, 1994).

**Faculty Compensation and Reward**

Related to the support of the faculty through training programs was the need to compensate and reward the faculty for their efforts in this new and challenging avenue of instruction (Distance Education Policy Recommendation, 1996). One reason for the importance of faculty compensation regarding teaching in a distance-learning environment was the mixed reactions that were given toward distant
teaching. Some faculty considered that it was less rewarding for career growth, and that it was less scholarly than other forms of teaching. Factors listed above could influence promotion and tenure decisions (Olcott & Wright, 1995).

In distance education, teaching activities, especially those associated with research or doctoral institutions, receive limited or no consideration in promotion, tenure, and wage considerations. Until teaching activities are noted in university mission statements, goals, and faculty job descriptions, there may be an "advancement penalty" associated with participating in such innovative teaching practices as distance education. For such situations, Olcott and Wright (1995) stressed the need for administrators to correct inadequate compensation, training, and incentive structures, to encourage faculty participation in distance learning instruction, and to relieve promotion and tenure fears for faculty doing distance teaching (Distance Education Policy Recommendation, 1996).

Unfortunately, Dillon (1989) noted that it has been shown that some vocally supportive administrators remain suspicious about the value of distance education. Dillon added that administrators needed to put their rewards where their administrative mouths were and reward excellence in distance learning, along with its required differences from traditional instruction. Wolcott (1997) supported Dillon's skepticism. Wolcott conducted a study with faculty members, distance learning program administrators, and chief academic officers at four research institutions of higher education. Wolcott found a reward culture that was not very accommodating toward faculty members working in DL or very rewarding of such endeavors.
Furthermore, Wolcott's research indicated that faculty participation in distance education was clearly linked to incentives and reward structures. According to Lewis (1985), the greatest deterrent to the effective use of information technology in higher education was the failure of incentive and reward systems to encourage faculty participation. The integration of distance education into mainstream higher education compels higher education institutions to reevaluate and design incentives which adequately reward faculty for distance-education activities.

Moreover, Wolcott (1997) argued that without adequate and valued rewards for the increasingly important dimension of faculty work, universities would have little chance of recruiting and retaining the best faculty. Furthermore, the traditional reward structure, based on tenure and promotion, emphasized research and publication. The traditional reward structure does not emphasize technological innovation and participation in distance education. In most colleges and universities today, tenure and promotion policies pay little attention to information technology (Gilbert, 1996).

According to Wolcott (1997), participation in distance education provided no measurable advantage in earning credit toward tenure or advancement in rank. Credit for participating in distance education does not go toward research and publication, rather it goes toward the category of teaching and contributes to an individual's overall teaching record (Wolcott, 1997).

Tenure and promotion is unquestionably linked to professional advancement. Consequently, the emphasis on research and publication, not on innovation, may actually discourage faculty from participating in distance education (IDE, 1997). The appropriate recognition for technological innovation and participation in distance education must be
considered when reviewing traditional reward structures and tenure and promotion policies because, ultimately, most faculty members will pursue activities that contribute to their professional advancement (Olcott, 1991).

As recommended by Diamond and Adam (1993), higher education "must reconsider the role of the professoriate and develop promotion, tenure, and merit reward systems that are appropriate for individual faculty members and consistent with the priorities of the institution and the values of the individual discipline" (p. 2). Lynch and Corry (1998) wrote that faculty would not learn new web-based instruction technical techniques without some motivation and encouragement offered by the institution. In fact, one of the most challenging questions to confront those familiar with traditional models for compensating faculty is how to convince faculty to engage in the extra work, responsibilities, and time required by web-based instruction (Lynch & Corry, 1998). In addition, Lynch and Corry (1998) noted that compensating faculty was and will continue to be a complex problem. Therefore, it is imperative that institutions establish a comprehensive faculty development program including incentives.

Moreover, Cho and Berge (2002) acknowledged that an instructor should be encouraged to participate in planning and designing the DE program, as well as doing the instruction. Faculty play multiple roles and must be trained to use all the necessary instructional tools. In addition, Cho and Berge (2002) concluded that the fastest way to improve the quality of DE was to improve the instructional design of the course to carefully match objectives to outcomes. By improving the quality of DE means that adequate rewards and enough time to prepare the instruction must be allowed (Cho & Berge, 2002).
Academic Quality

The issue of maintaining academic quality is a universal concern among faculty, students, and administrators (Dark, 1993; Koontz, 1989; Olcott, 1991). Faculty are particularly concerned about the quality of interaction, socialization and affective development, and availability of college-level resources such as library and computer access (Clark, 1993). Furthermore, Clark learned through a national survey that faculty support for distance courses was tempered by concern for quality of interaction, administrative support, and rewards.

Technical Support

Berge and Muilenburg (2001) declared that support and infrastructure were difficult “for whom?” to keep up with the fast pace of technological change. Many instructors lack the knowledge and skills to design and teach distance-learning courses, however their organizations do not provide a support staff to assist them to develop distance learning course materials, or to provide distance-learning training. In addition, the technology-enhanced classrooms or laboratories and the infrastructure required to use them may not be available.

Lack of Funding

Technology considerations are self-evident, but are the most easily solved. Technology problems include: financing new technology; telecommunications; hardware issues; course production and technology; and, Internet problems. A primary concern for both learning institutions and faculty is availability of funds. When technology is used, the costs increase substantially for both the student and the institution. Universities must consider the initial costs as well as the continuing costs of installing, maintaining, using,
and upgrading technology to support distance services (Galusha, 1997). Furthermore, Berge and Muilenburg (2001) agreed that the lack of grant monies to fund distance learning start-up and subsequent projects was a problem.

**Faculty Workload**

In a study conducted by Schifter (2000), faculty and administrators were asked to rate from 5 to 1 (5 = strongly agree; 1 = strongly disagree) to what extent they believed 17 factors had inhibited or would inhibit them from participating in DE. The top five inhibiting factors for participators in DE were lack of technical support provided by the institution, lack of release time, concern about faculty workload, lack of grants for materials/expenses, and concern about quality of courses.

**Regression Analyses of Barriers of Web-based Distance Education Technology by University Teachers**

Pajo and Wallace (2001) reported results of the regression analyses used to investigate the influence of personal, attitudinal, and organizational barriers on the decision by academic staff (faculty) to adopt web-based technology. Factor 1, labeled *personal barriers*, appeared to represent individual obstacles to the uptake of web-based technology. The items loading on Factor 1 reflected staff concerns about the personal time, effort, and skills required to implement web-based learning. Factor 2, categorized as *attitudinal barriers*, incorporated a cluster of items that reflected broader philosophical concerns and affective reactions to web-based learning in general. The final factor, labeled *organizational barriers*, included items that asked about institutional support and encouragement of web-based teaching.
According to Pajo and Wallace (2001) the results from their study highlighted the relatively slow diffusion of web-based teaching initiatives among the participants in the present study. Furthermore, e-mail and library access were the only web-based technologies used by most of the respondents. Other more “sophisticated” elements of web-based teaching, such as online tests and discussion forums, had much lower rates of adoption by academic staff. The lethargic uptake of full-blown web-based teaching approaches can be linked to a number of factors which impede the implementation of web-based teaching by faculty. The most commonly mentioned barriers identified in the Pajo and Wallace study were those related to time pressures, a perceived lack of training and skills, and a scarcity of organizational support and resources. In other studies where teachers have been surveyed, similar concerns have been expressed (Daugherty & Funke, 1998; Hare & McCartan, 1996; James & Beattie, 1996; Mudge, 1999; Schifter, 2000; Thompson & Holt, 1996; Wolcott & Betts, 1999). Moreover, Pajo and Wallace (2001) acknowledged that until now, no effort had been made to quantify the influence of barriers, or to explore systematically the relationship between specific types of barriers and different outcomes associated with the uptake of technology.

In the Pajo and Wallace (2001) study, a factor analysis of the barrier items resulted in a 3-factor solution that together accounted for slightly more than 50% of the variance in respondents’ ratings. Through using the factor scores in a regression analysis, it was possible to identify the relative contribution of each constellation of barriers to the prediction of a range of uptake outcome measures. Additionally, Pajo and Wallace reported that an intriguing pattern of results emerged from their analysis. The important
influence of barriers on adoption decisions was clearly established. Overall, the presence and strength of perceived barriers contributed significantly to the prediction of all the outcome measures.

However, barriers were found to explain more of the variance in current use of web-based teaching and the perceived ease of use of the technology (37% and 35% respectively) than enjoyment, future intentions to adopt, and perceptions of usefulness (22%, 21%, and 12% respectively). Moreover, for each outcome measure, only one factor was found to be influential: either personal barriers or attitudinal barriers. Contrary to expectations, the presence of organizational barriers (those related to organizational support and encouragement of the use of web-based technology) did not contribute significantly to the prediction of any outcome measures. The different roles of personal and attitudinal barriers to the prediction of current use and future intentions to adopt web-based technology were an interesting finding in the Pajo and Wallace study.

Current use of the technology was most closely associated with personal barriers (Pajo & Wallace, 2001). Those who believed they lacked the skills and training to use the technology and who perceived that it required a greater commitment of time and effort than they had available, were less likely currently to incorporate web-based delivery in their distance teaching. In contrast, future intentions to adopt web-based teaching were most closely associated with negative attitudes and beliefs about web-based delivery in general.

The results of the Pajo and Wallace (2001) study have practical implications for organizations that wish to encourage the acceptance of web-based learning among academic staff. The salience of distinct barriers at different points in the innovation
adoption process suggested that organizations must adopt a flexible strategy for their elimination. The formulation of intentions to behave in a certain way (e.g., to start using an innovation) is commonly understood to precede the individual's engagement in that behavior (Davis, Bagozzi, & Warshaw, 1989).

Therefore, for an organization who wishes to encourage the adoption of an innovation, eliminating negative attitudes and beliefs about that innovation would appear to be a critical first step. Once eliminating negative attitudes and beliefs about that innovation is achieved, attention can then be turned to eliminating other barriers (such as those reflected in the personal barriers factor) that may be preventing an individual from translating his or her intentions into behavior (Pajo & Wallace, 2001). Although it was noteworthy that organizational barriers did not play an influential role in determining uptake decisions, this argument does not mean that organizational initiatives are redundant. Various approaches such as guided mastery learning experiences, persuasive communications, and publicizing and promoting successful uptake experiences by peers may be appropriate interventions that an organization may use to encourage positive attitudes and beliefs about web-based learning.

The same techniques may also be helpful in eliminating personal barriers in the uptake of the technology (Pajo & Wallace, 2001). Furthermore, Pajo and Wallace (2001) stated that faculty concerned over the amount of time required to implement and monitor web-based teaching initiatives were among the most significant barriers identified in their survey; an area where organizations can effectively intervene. Providing adequate
support, ensuring reasonable workloads, and making it easier for staff to make the transition to the new technologies would assist in facilitating the rapid diffusion of web-based teaching initiatives.

Finally, Pajo and Wallace (2001) concluded that it was vital for educational organizations to be aware of the barriers that hinder staff from implementing web-based approaches in distance education. The promise of web-based distance learning can only be fulfilled if faculty members have the opportunity and motivation to use the technology. Substantial investments in information technology by universities will count for nothing if staff is overwhelmed by the barriers they encounter.

Summary

Chapter 2 presented a review of relevant literature on distance education and distance learning faculty. The chapter identified and examined some conditions, which can form barriers for faculty members who were considering teaching in a distance education environment. The body of literature in this chapter addressed the research questions and objectives of this study regarding the use of web-based technology; faculty use of electronic technologies; level of importance; level of competence; available of equipment and facilities; faculty participation in agriculture distance education programs; faculty resistance; and, factors which influenced faculty participation in web-based distance education. The review of literature also helped the researcher to select variables to meet the objective of identifying predictors of faculty participation in web-based distance education.
Chapter 3 discusses the procedures involved in conducting the research. The procedures are described in the following order: (a) population and sample, (b) research design, (c) instrumentation, (d) data collection, and (e) data analysis.

**Population**

The target population for the current study was agricultural teacher educators. The accessible population for this study was agricultural teacher educators listed in the *Directory of University Faculty in Agricultural Education* provided by the American Association of Agricultural Educators (AAAE) on February 14, 2002. The population selected included practicing agricultural teacher educators as defined by Cano (2002) and Castillo (1999).

Castillo (1999) in a national study of agricultural teacher educators asked the department chairs at their respective university to identify those who were agricultural teacher educators. The Castillo (1999) list of teacher educators was purged by Cano
(2002) to delete those teacher educators who were no longer employed by a university. In addition, those newly hired agricultural teacher educators were added to the list by Cano (2002).

The final list of agricultural teacher educators was further verified by comparing the generated list of agricultural teacher educators with the AAAE directory. The list of practicing agricultural teacher educators included 98 individuals (n=98). A census was used for the study.

**Research Design**

The current study investigated the factors which influenced agricultural teacher educators' participation in web-based distance education for delivering instruction in agricultural programs. In addition, the study sought to discuss agricultural teacher educators' perceptions of their level of competence, level of importance, availability of infrastructure, training, and perceived major barriers faced in using web-based distance education technologies for delivering instruction in agriculture programs.

The research design used in the study was classified as exploratory descriptive and correlational. According to Fraenkel and Wallen (2000), correlational studies investigate the possibility of a relationship among two or more variables without any attempt to influence any variable. In addition, Fraenkel and Wallen (2000) stated that correlational studies described the degree to which two or more quantitative variables were related.

One of the objectives of this study was to determine the relationships among selected variables and agricultural teacher educators' participation in web-based distance education. Therefore, in determining the strength of relationships, descriptors as
recommended by Davis (1971), were used. According to Davis (1971) conventions for describing measures of association were the following: .70 or higher very strong association; .50 to .69 substantial association; .30 to .49 moderate association; .10 to .29 low association; and, .01 to .09 negligible association.

Two rules were set a priori. First, in order for the variable to have been considered for further analysis in the multiple regression procedure, the variable must have had a correlation value of .10 or greater. Second, the variable must have had a significant relationship with faculty participation in web-based distance education. In addition, all hypotheses were tested at alpha .05.

**Dependent Variable**

The dependent variable for this investigation was agricultural teacher educators’ participation in web-based distance education.

**Independent Variables**

The major independent variables were classified in four categories:

1. Level of competence;
2. Level of importance (value);
3. Availability of infrastructure and training; and,
4. Major barriers

**Instrumentation**

The instrument used to collect data was a three-part questionnaire designed by Dooley and Murphy (2001) and modify by the researcher for this study (Appendix A). The instrument was four pages long and designed to be automatically scanned into a digital file by an optical character recognition (OCR) scanner. Part I of the questionnaire
was designed to identify the selected personal and professional characteristics of the respondents and described their current level of involvement in the use of web-based distance education technology-mediated instruction.

Seven questions were devoted to demographic and professional variables. The seven questions were gender, age, the number of courses the faculty member taught per year, the number of years the faculty member had been teaching, region (western, eastern, central, and southern), the tenure status of the faculty member (non-tenure track, non-tenure, and tenured), and their academic rank or title (assistant professor, associate professor, and professor). An additional 12 questions were used to describe the respondents' current level of participation in web-based distance education technology. The 12 questions were how many of the agricultural teacher educators had a website, how used, where the course website resided, software used, computer operating system used, who created or maintained the web page, training on videoconferencing and web-based, where the training was received, frequencies teaching at distance, and participation in web-based.

Part II consisted of 32 statements designed to measure the level of competence of agricultural teacher educators have in the use of web-based technologies associated with distance education, perceived value or level of importance the technologies have or will have to the teaching of agriculture, and perceived availability of infrastructure related to the use of these technologies. The availability of infrastructure has four additional yes/no question about e-mail and WWW connections at home and office, and awareness about
videoconferencing. Part III consisted of 13 statements designed to measure the perceived barriers which would inhibit agricultural teacher educators decision to participate in web-based distance education.

Validity and Reliability

A panel of five experts made up of one faculty member from the Department of Educational Policy and Leadership (EDU P&L), one specialist from the Technology Enhancement Learning and Research (TELR), one faculty from the College of Social Work, one Graduate Research Associate from Department of Human and Community Resources Development (HCRD), and one Graduate Administrative Associate from the Department of Human and Community Resources Development (HCRD) established content and face validity of the instrument (Appendix B and Appendix C).

The panel of experts completed the questionnaire and rated the content and clarity of the items and the length and format of the questionnaire. Panel participants offered suggestions for rewording some items, as well as deleting and clarifying some items. These recommendations were used to revise the instrument. After the panel of experts validated the questionnaire, a pilot test was conducted using selected faculty members from the Department of Human and Community Resource Development (Agricultural Communication) and the Department of Agricultural, Environmental and Development Economics at The Ohio State University (Appendix D).

After the pilot test was reviewed for recommended changes, questions, and consistency, revisions were made to selected questions for the questionnaire. The questionnaire was reviewed once again by the researcher and the panel of experts for clarity and consistency within the questions.
Cronbach Alphas were calculated to measure the reliability of the pilot test.

The results of the calculations were as follows:

a) Level of Competence (questions from 12 to 23) = .89
b) Level of Importance (questions from 24 to 34, and 43) = .80
c) Availability of Infrastructure (questions from 35 to 42) = .80
d) Major Barriers (questions from 44 to 56) = .83

The alpha of the questionnaire was .83.

Collection of Data

A four-phase follow-up sequence was used to collect the data. First phase- On March 15, 2002, all identified agricultural teacher educators (n=98) were contacted by e-mail to notify them, that they would be receiving a request to participate in an important study (Appendix E).

Second-phase- On March 16, 2002, after the e-mail notice, the researcher sent the questionnaire packet to the identified agricultural teacher educators along with a cover letter describing the study (Appendix F). Regular United States postage mail was used to send the questionnaire packet. The questionnaire packet included: (a) a cover letter describing the study (Appendix F); (b) a postcard with web-based definition (Appendix H); (c) the questionnaire (Appendix A); (d) a self-addressed stamped envelope; and, (e) a blue pen as a token of appreciation, labeled with a “thank you” logo (Appendix K).

Third-phase- On March 22, 2002, the researcher sent to all identified agricultural teacher educators (n=98) a postcard thank you/reminder (Appendix G). According to Dillman (2000), a postcard thank you/reminder serves both as a thank you for those who have responded and as a friendly and courteous reminder for those who have not.
Fourth-phase- On April 16, 2002, a letter and replacement questionnaire were sent only to non-respondents. Similar in appearance to the original mail out, but with a shorter cover letter that informed non-respondents that their questionnaire has not been received and appeals for its return (Appendix I). In addition, a follow up e-mail reminder was sent to non-respondents four weeks after the initial mail out (Appendix J). Those non-responding faculty were contacted via telephone. In each case, faculty were encouraged to complete the survey and additional instruments were supplied upon request.

Of the 98 survey instruments mailed, 54 were returned within two weeks, for an initial response rate of 55%. After two weeks, a reminder thanks you/postcard (Appendix L) was sent to non-respondents along with a second copy of the survey instrument yielding an additional 31 responses. In all, 85 survey instruments were returned for a final response rate of 87%. Survey and follow-up procedures were in accordance with those outlined by Dillman (2000).

An attempt to control non-response error was made by comparing the demographic and professional data from the early and late respondents as suggested by Miller and Smith (1983). Early respondents were those who returned the completed questionnaire one week after the initial mailing. No significant differences were found between the early and late respondents.

Data Analysis

Data collected were analyzed using SPSS software version 11.0 for Windows. Since the study was designed to be exploratory descriptive-correlational in nature, descriptive statistics were used to organize, describe, summarize, and simplify data sets
using frequencies and percentages, means, standard deviations, medians, and modes. In
addition, all research hypotheses were tested at alpha .05.

In order to guide the data analysis, a description of the analysis utilized by each
objective is described:

1. Describe what were the selected personal and professional characteristics (age,
gender, tenure status, and years of teaching experience, teaching load, academic
rank, and region) of agricultural teacher educators.
   a) Descriptive statistics for Objective 1 were used to organize, describe,
      summarize, and simplify data sets using frequencies, percentages, and
      range.

2. Describe how many of the faculty had a website, how used, where the course
   website resided, software used, computer operating system used, and who created
   or maintained the web page.
   a) Descriptive statistics for Objective 2 were used to organize, describe,
      summarize, and simplify data sets using frequencies, percentages, and
      range.

3. Describe training related to the use of web-based technology, and
   videoconferencing to deliver distance education, where training on web-based and
   videoconferencing technologies was received, and how many courses have been
   taught using distance education by the agricultural teacher educators, and level of
   participation using web-based distance education technologies.
a) Descriptive statistics for Objective 3 were used to organize, describe, summarize, and simplify data sets using frequencies, percentages, means, standard deviations, medians, and modes.

4. Describe what was the perceived level of competence that agricultural teacher educators have in the use of web-based technologies.

   a) Descriptive statistics for Objective 4 were used to organize, describe, summarize, and simplify data sets using frequencies, percentages, means, standard deviations, medians, and modes.

   b) In addition, each respondent's item score was summarized. The greater the level of competence/skills, the more skilled towards use of web-based technologies in distance education; the lower level of perceived competence the less skilled towards use of web-based technologies in distance education.

   c) The following range was used to identified the level of perceived competence:

      a) 5.00-4.49 High Level of Competence  
      b) 4.49-3.50 Moderate Level of Competence  
      c) 3.49-2.50 Neutral Level of Competence  
      d) 2.49-1.50 Low Level of Competence  
      e) 1.49-1.00 No Competence  

   d) The high, moderate, neutral, low, and no competence ranks were considered the measure of the perceived level of competence which
agricultural teacher educators indicated they were able to use web-based technologies for distance education.

5. Describe agricultural teacher educators perceptions of the level of importance of web-based technologies have or will have in teaching and learning.

a) Descriptive statistics for Objective 5 were used to organize, describe, summarize, and simplify data sets using frequencies, percentages, means, standard deviations, medians, and modes.

b) In addition, each respondent's item score was summarized. The greater the level of importance, the more value web-based technologies have or will have in teaching and learning; the lower level of perceived importance, the less value web-based technologies have or will have in teaching and learning.

c) The following range was used to identify the perceived level of importance:

a) 5.00-4.50 High Level of Importance
b) 4.49-3.50 Moderate Level of Importance
c) 3.49-2.50 Neutral Level of Importance
d) 2.49-1.50 Low Level of Importance
e) 1.49-1.00 Not Important

d) The high, moderate, low, and not important ranks were considered the measure of the perceived level of importance that the agricultural teacher educators indicated web-based technologies have in teaching at distance education.
6. Determine the perceived availability of infrastructure for agricultural teacher educators to use web-based technologies.

a) Descriptive statistics for Objective 6 were used to organize, describe, summarize, and simplify data sets using frequencies, percentages, means, standard deviations, medians, and modes.

b) In addition, each respondent’s item score was summarized. Greater scores indicated awareness of the infrastructure available for agricultural teacher educators to use; lower scores indicated agricultural teacher educators were not aware of the infrastructure available to use it.

c) The following range was used to identify the level of perceived infrastructure available:

   a) 5.00-4.50 High awareness
   b) 4.49-3.50 Moderate awareness
   c) 3.49-2.50 Neutral awareness
   d) 2.49-1.50 Low awareness
   e) 1.49-1.00 No awareness

d) The high, moderate, low, and no awareness ranks were considered the measure of the perceived infrastructure that agricultural teacher educators indicated was available for use web-based technologies in distance education.
7. Describe what the agricultural teacher educators perceived as major barriers for participating in the use of web-based technologies for delivering distance instruction in agricultural education settings.

   a) Descriptive statistics for Objective 7 were used to organize, describe, summarize, and simplify data sets using frequencies and percentages, means, standard deviations, medians, and modes.

   b) For the purposes of measure the barrier variable, a Likert scale was used. The lower the barrier score the less inhibited agricultural teacher educators were in using web-based technologies for distance education; the greater the barriers score the more inhibited agricultural teacher educators were in using web-based technologies for distance education.

   c) The following range was used to identified the perceived major barriers for participating in the use of web-based technologies:

      a) 5.00-4.50 High Barrier
      b) 4.49-3.50 Moderate Barrier
      c) 3.49-2.50 Neutral Barrier
      d) 2.49-1.50 Low Barrier
      e) 1.49-1.00 Not a Barrier

   d) The high, moderate, neutral, low, and not a barrier ranks were considered the measure of what agricultural teacher educators perceived as major barriers which inhibit participation in using web-based technologies in distance education.
8. Describe what relationship exist between:

a) The perceived level of competence and selected personal and professional characteristics (age, gender, rank, tenure status, year of teaching experience and prior experience in teaching courses using distance education, and training).

1. Spearman rank-order correlation coefficients and Point Biserial correlation coefficients were used to summarize the magnitude and direction of the relationship between the variables.

2. To use Spearman rank-order correlation coefficient, raw scores on the age, and years of teaching experience were considered ordinal data and correlated with raw scores on the level of competence which was interval data.

3. To use Point Biserial, raw scores on rank, tenure status, gender, training, and prior experience in teaching courses using distance education were considered nominal data and correlated with raw scores on the level of competence, which was interval data. According to Glass and Hopkins (1996), the Point Biserial correlation coefficient was calculated to describe the relationship between a nominal variable and interval data or ratio variable. The Point Biserial is a Pearson Product-moment coefficient.

4. Descriptors identified by Davis (1971) were used to describe the measures of association.
b) The perceived level of importance and selected personal and professional characteristics (age, gender, rank, tenure status, year of teaching experience and prior experience in teaching courses using distance education, and training).

1. Spearman rank-order correlation coefficients and Point Biserial correlation coefficients were used to summarize the magnitude and direction of the relationship between the variables.

2. To use Spearman rank-order correlation coefficient, raw scores on the age, and years of teaching experience were considered ordinal data and correlated with raw scores on the level of importance which was interval data.

3. To use Point Biserial, raw scores on the gender, training, and prior experience in teaching courses using distance education were considered nominal data and correlated with raw scores on the level of importance, which was interval data. According to Glass and Hopkins (1996) the Point Biserial correlation coefficient was calculated to describe the relationship between a dichotomous nominal variable (with categories coded 1 and 0) and interval data or ratio variable. The Point Biserial is a Pearson Product-moment coefficient.
4. Descriptors identified by Davis (1971) were used to describe the measures of association.

c) The perceived availability of infrastructure, and level of competence.

1. Pearson-Product moment correlation coefficients were used to summarize the magnitude and direction of the relationship between the variables.

2. A Pearson-Product moment correlation coefficient was calculated to describe the relationship between an interval or ratio variable (raw scores on perceived availability of equipment and facilities) and other interval data or ratio variable (raw scores on level of competence).

3. Descriptors identified by Davis (1971) were used to describe the measures of association.

d) The perceived major barriers and the level of importance.

1. Pearson-Product moment correlation coefficients were used to summarize the magnitude and direction of the relationship between the variables.

2. A Pearson-Product moment correlation coefficient was calculated to describe the relationship between an interval or ratio variable (raw scores on perceived major barriers) and other interval data or ratio variable (raw scores on level of importance).
3. Descriptors identified by Davis (1971) were used to describe the measures of association.

e) The perceived major barriers and the level of competence.

1. Pearson-Product moment correlation coefficients were used to summarize the magnitude and direction of the relationship between the variables.

2. A Pearson-Product moment correlation coefficient was calculated to describe the relationship between an interval or ratio variable (raw scores on perceived major barriers) and other interval data or ratio variable (raw scores on level of competence).

3. Descriptors identified by Davis (1971) were used to describe the measures of association.

f) The perceived major barriers and the level of importance.

1. Pearson-Product moment correlation coefficients were used to summarize the magnitude and direction of the relationship between the variables.

2. A Pearson-Product moment correlation coefficient was calculated to describe the relationship between an interval or ratio variable (raw scores on perceived major barriers) and other interval data or ratio variable (raw scores on level of importance).
3. Descriptors identified by Davis (1971) were used to describe the measures of association.

9. Explain the variance in the dependent variable, participation in web-based distance education, through a linear combination of the independent variables.

To explain the variance in the dependent variable, Pearson-Product moment correlation, Point Biserial correlation, and Spearman rank-order coefficients, and multiple R coefficients from the regression analysis were used to summarize the magnitude and direction of the relationship between variables. In addition, descriptors identified by Davis (1971) were used to describe the measures of association. The squared semi-partial multiple regression correlation coefficient ($sr^2$) were calculated for each independent variable. The statistical procedures described above was calculated in order to determine the proportion of the dependent variable that was explained by each independent variable when a linear effect of the other independent variables had been removed from the independent variable being considered.

Finally, the simultaneous model multiple regression was used to determine the significant independent variables that could best predict the faculty participation in web-based distance education. The simultaneous model multiple regression is a strategy that is most appropriate when there is no logical or theoretical basis for considering any independent variable prior to any other independent variable (Warmbrod, 1983; Stevens, 1992).
The following research hypotheses were generated for question #8

**Hypothesis 8a:**

There is no relationship between the perceived level of competence and selected personal and professional characteristics (age, gender, rank, tenure status, year of teaching experience, and prior experience in teaching courses using distance education, and training).

1. To test the hypothesis, Spearman rank-order correlation coefficients were used to determine the relationship between the age, year of teaching experience, and level of competence. To use Spearman rank-order correlation coefficients' raw scores on the age, years of teaching experience were considered ordinal data and correlated with raw scores on the level of competence, which was interval data.

2. To test the hypothesis, Point Biserial correlation coefficients were used to determine the relationship between gender, rank, tenure status, training, prior experience in teaching courses using distance education, and the level of competence. To use Point Biserial correlation coefficients, raw scores on gender, rank, tenure status training, and prior experience in teaching courses using distance education were considered nominal data and correlated with raw scores on the level of competence, which was interval data.

The null hypothesis was: \( H_0: \rho = 0 \)

The research hypothesis was: \( H_1: \rho \neq 0 \)
Hypothesis 8b:

There is no relationship between the perceived level of importance and selected personal and professional characteristics (age, gender, rank, tenure status, year of teaching experience, and prior experience in teaching courses using distance education, and training).

1. To test the hypothesis, Spearman rank-order correlation coefficients were used to determine the relationship between age, year of teaching experience, and level of importance. To use Spearman rank-order correlation coefficients, raw scores on the age, and years of teaching experience were considered ordinal data and correlated with raw scores on the level of importance, which was interval data.

2. To test the hypothesis, Point Biserial correlation coefficients were used to determine the relationship between gender, rank, tenure status, training, prior experience in teaching courses using distance education, and the level of importance. To use Point Biserial correlation coefficients, raw scores on gender, rank, tenure status, and training were considered nominal data and correlated with raw scores on the level of importance, which was interval data.

The null hypothesis was: Ho: \( \rho = 0 \)

The research hypothesis was: \( H_1: \rho \neq 0 \)
Hypothesis 8c:

There is no relationship between the perceived availability of infrastructure, and level of competence.

1. To test the hypothesis, Pearson product-moment correlation coefficients were used to determine the relationship between the perceived availability of infrastructure and level of competence. To use the Pearson product-moment correlation coefficient, raw scores on perceived availability of infrastructure were considered interval data and correlated with raw scores on the level of competence, also considered interval data.

The null hypothesis was: \( H_0: \rho = 0 \)

The research hypothesis was: \( H_1: \rho \neq 0 \)

Hypothesis 8d:

There is no relationship between the perceived availability of infrastructure, and level of importance.

1. To test the hypothesis, Pearson product-moment correlation coefficients were used to determine the relationship between the perceived availability of infrastructure and level of importance.
To use Pearson product-moment correlation coefficients, raw scores on perceived availability of equipment and facilities were considered interval data and correlated with raw scores on the level of importance, also considered interval data.

The null hypothesis was: \( H_0: \rho = 0 \)

The research hypothesis was: \( H_1: \rho \neq 0 \)

**Hypothesis 8e:**

There is no relationship between the major barriers and the level of importance.

1. To test the hypothesis, Pearson product-moment correlation coefficients were used to determine the relationship between the perceived major barriers and level of importance.

2. To use Pearson product-moment correlation coefficients, raw scores on perceived major barriers were considered interval data and correlated with raw scores on the level of importance, also considered interval data.

The null hypothesis was: \( H_0: \rho = 0 \)

The research hypothesis was: \( H_1: \rho \neq 0 \)

**Hypothesis 8f:**

There is no relationship between the major barriers and the level of competence.

1. To test the hypothesis, Pearson product-moment correlation coefficients were used to determine the relationship between the perceived major barriers and level of competence.
2. To use Pearson product-moment correlation coefficients, raw scores on perceived major barriers were considered interval data and correlated with raw scores on the level of competence, also considered interval data.

The null hypothesis was: \( H_0: \rho = 0 \)

The research hypothesis was: \( H_1: \rho \neq 0 \)

Summary

Chapter 3 provided the methodology followed in conducting the current research. The population and accessible population were described as well as the procedures for data collection. The instrumentation process was detailed and validity and reliability were furnished. Finally, the data analysis procedures were defined.
CHAPTER 4

FINDINGS

This chapter presents the findings of the research study and is organized into nine major sections: (a) description of the population; (b) description of the level of involvement in using web-based and videoconferencing technologies; (c) description of training related to the use of web-based technologies, and level of participation agricultural teachers educators have in web-based technologies to deliver distance education; (d) description of the perceived level of competences or skills that agricultural teachers educators have in web-based technologies; (e) description of the perceived level of importance that web-based technologies have in teaching and learning; (f) description of the perceived availability of infrastructure for agricultural teachers educators to use web-based technologies; (g) description of the perceived major barriers for participating in the use of web-based technologies; (h) relationships among variables and research hypotheses; and, (i) multiple regression procedures.
To guide the study, the following research objectives were discussed:

1. Describe the selected personal and professional characteristics (age, gender, tenure status, and years of teaching experience, teaching load, academic rank, and region) of agricultural teacher educators.

2. Describe how many of the agricultural teacher educators had a website, how used, where the course website resided, software used, computer operating system used, and who created or maintained the website.

3. Describe training related to the use of web-based and videoconferencing technology to deliver distance education, where training on web-based and videoconferencing technologies was received, and how many courses have been taught using distance education by the agricultural teacher educators, and level of participation in web-based distance education technologies.

4. Describe what was the perceived level of competence that agricultural teacher educators have in the use of web-based technologies.

5. Describe agricultural teacher educators perceptions of the level of importance of web-based technologies have or will have in teaching and learning.

6. Determine the perceived availability of infrastructure for agricultural teacher educators to use web-based technologies.

7. Describe what the agricultural teacher educators perceived as major barriers for participating in the use of web-based technologies for delivering distance instruction in agricultural settings.
8. Describe what relationship existed between:

a. The perceived level of competence and selected personal and professional characteristics (age, gender, rank, tenure status, year of teaching experience and prior experience in teaching courses using distance education, and training in web-based technologies).

b. The perceived level of importance and selected personal and professional characteristics (age, gender, rank, tenure status, year of teaching experience and prior experience in teaching courses using distance education, and training in web-based technologies).

c. The perceived availability of infrastructure, and level of competence.

d. The perceived availability of infrastructure, and level of importance.

e. The perceived identified major barriers and the level of importance.

f. The perceived identified major barriers and the level of competence.

9. Explain the variance in the dependent variable, participation in web-based distance education, through a linear combination of the independent variables.

The following research hypotheses were generated for question #8

a. There was no relationship between the perceived level of competence and selected personal and professional characteristics (age, gender, rank, tenure status, year of teaching experience and prior experience in teaching courses using distance education, and training in web-based technologies).

b. There was no relationship between the perceived level of importance and selected personal and professional characteristics (age, gender,
rank, tenure status, year of teaching experience and prior experience in teaching courses using distance education, and training in web-based technologies).

c. There was no relationship between the perceived availability of infrastructure, and level of competence.
d. There was no relationship between the perceived availability of infrastructure, and level of importance.
e. There was no relationship between the identified major barriers and the level of importance.
f. There was no relationship between the identified major barriers and the level of competence.

Section A

Description of the Population

The demographic characteristics for the study were: age, gender, tenure status, and years of teaching experience, teaching load, academic rank, and region. Each characteristic is discussed in the following section.

Age of Agricultural Teacher Educators

The data presented on Table 1 shows how the agricultural teacher educators were distributed across five age categories. The majority (78%) of the agricultural teacher educators were between the ages of 41 to 65 years while 20 percent of the agricultural teacher educators were between the ages of 30 to 40 years.
Gender of Agricultural Teacher Educators

Figure 1 shows the gender of the agricultural teacher educators. The majority of the agricultural teacher educators (92%) were male, while 8 percent were female.

Tenure Status of Agricultural Teacher Educators

The data presented on Figure 2 revealed that 1 percent of the agricultural teacher educators were Non-Tenured Track. On the other hand, 83 percent of the agricultural teacher educators were Tenured, and 15 percent were Non-Tenured.

<table>
<thead>
<tr>
<th>Age</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 30</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>30-40</td>
<td>17</td>
<td>20.0</td>
</tr>
<tr>
<td>41-50</td>
<td>29</td>
<td>34.1</td>
</tr>
<tr>
<td>51-65</td>
<td>37</td>
<td>43.5</td>
</tr>
<tr>
<td>66 and older</td>
<td>1</td>
<td>1.2</td>
</tr>
<tr>
<td>Missing</td>
<td>1</td>
<td>1.2</td>
</tr>
<tr>
<td>Total</td>
<td>85</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Note. Median= 41-50

Table 1: Age of Agricultural Teacher Educators
Figure 1: Gender of Agricultural Teacher Educators

- Male: 92%
- Female: 8%
- Missing: 1%

Figure 2: Tenure Status of Agricultural Teacher Educators

- Tenured: 83%
- Non-Tenured: 15%
- Non-Tenure Track: 1%
- Missing: 1%
**Year of Teaching Experience of Agricultural Teacher Educators**

The data presented on Table 2 indicates that most (76.2%) agricultural teacher educators have more than 16 years of teaching experience. In addition, the data presented on Table 2 shows that 21% have 6 to 15 years of experience, while 2.4% have 2 to 5 years of experience.

**Teaching Load (number of courses taught per year)**

As reported on Table 3, 80.7% of agricultural teacher educators, taught 1 to 7 courses per year, while 1.2% indicated they taught 12 courses per year.

<table>
<thead>
<tr>
<th>Teaching experience</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 2</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>2-5</td>
<td>2</td>
<td>2.4</td>
</tr>
<tr>
<td>6-10</td>
<td>3</td>
<td>3.5</td>
</tr>
<tr>
<td>11-15</td>
<td>15</td>
<td>17.6</td>
</tr>
<tr>
<td>&gt;16</td>
<td>65</td>
<td>76.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>85</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Table 2: Year of Teaching Experience of Agricultural Teacher Educators
<table>
<thead>
<tr>
<th>Teaching load</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.00</td>
<td>1</td>
<td>1.2</td>
</tr>
<tr>
<td>1.00</td>
<td>1</td>
<td>1.2</td>
</tr>
<tr>
<td>2.00</td>
<td>3</td>
<td>3.5</td>
</tr>
<tr>
<td>3.00</td>
<td>9</td>
<td>10.6</td>
</tr>
<tr>
<td>4.00</td>
<td>12</td>
<td>14.1</td>
</tr>
<tr>
<td>5.00</td>
<td>24</td>
<td>28.2</td>
</tr>
<tr>
<td>6.00</td>
<td>7</td>
<td>8.2</td>
</tr>
<tr>
<td>7.00</td>
<td>12</td>
<td>14.1</td>
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<td>7.1</td>
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<td>9.00</td>
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<td>1.2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>85</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Table 3: Teaching Load (number of courses taught per year)
**Academic Rank of Agricultural Teacher Educators**

The data presented on Figure 3 revealed that 19% of the agricultural teacher educators were Assistant Professor, while 56% were Professor, and 24% were Associate Professor.

**Regions of Agricultural Teacher Educators**

The data presented on Figure 4 indicated that most (39%) agricultural teacher educators were from the Southern region. In addition, the data presented on Figure 4 shows that 28% agricultural teacher educators were from the Central region, 22% were from the Western regions, and 11% were from the Eastern region.
Figure 3: Academic Rank of Agricultural Teacher Educators

Figure 4: Regions of Agricultural Teacher Educators

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Section B

Description of the Level of Involvement Using Web-Based Technologies

A description of how many of the agricultural teacher educators had a website, how used, where the course website resided, software used, computer operating system used, and who created or maintained the web page is addressed in the following section.

Description of How Many of the Agricultural Teacher Educators had a Website

As reported on Figure 5, 61% of the agricultural teacher educators had a website, while 39% indicated not having a website.

Description of How the Website is Used

The data presented on Table 4 indicated that most (34%) agricultural teacher educators used a website for course enhancement. Twelve percent of the agricultural teacher educators used the website as a required component of the course, while 8% indicated that the course was delivered completely on the Web. In addition, 4% of the respondents indicate a combination between course enhancement, course requirement, and course completely delivered on the Web.

Description of Where the Course Website Reside

Data presented on Table 5 indicated that 24% of the course websites resided in the university server, 18% resided in the department server, and 14% in the college server. On the other hand, 1.2% reported a combination between university server, college server, and other.
Figure 5: Percentage of the Agricultural Teacher Educators that had a Website

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<table>
<thead>
<tr>
<th>The website is used:</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course enhancement</td>
<td>29</td>
<td>34.1</td>
</tr>
<tr>
<td>Required component of the course</td>
<td>10</td>
<td>11.8</td>
</tr>
<tr>
<td>Course is completely delivered on the web</td>
<td>7</td>
<td>8.2</td>
</tr>
<tr>
<td>No website</td>
<td>33</td>
<td>38.8</td>
</tr>
<tr>
<td>Required component and course is completely delivered on web</td>
<td>1</td>
<td>1.2</td>
</tr>
<tr>
<td>Course enhancement and course is completely delivered on web</td>
<td>2</td>
<td>2.4</td>
</tr>
<tr>
<td>Enhancement, required component, and course completely delivered on web</td>
<td>3</td>
<td>3.5</td>
</tr>
<tr>
<td>Total</td>
<td>85</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 4: How the Website is Used
<table>
<thead>
<tr>
<th>The course website reside:</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Departmental server</td>
<td>16</td>
<td>18.8</td>
</tr>
<tr>
<td>University server</td>
<td>20</td>
<td>23.5</td>
</tr>
<tr>
<td>College server</td>
<td>12</td>
<td>14.1</td>
</tr>
<tr>
<td>No website</td>
<td>33</td>
<td>38.8</td>
</tr>
<tr>
<td>Departmental server and college server</td>
<td>3</td>
<td>3.5</td>
</tr>
<tr>
<td>Central university server, college server, and other</td>
<td>1</td>
<td>1.2</td>
</tr>
<tr>
<td>Total</td>
<td>85</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 5: Where the Course Website Reside
<table>
<thead>
<tr>
<th>Software used or planned to use</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>HTML editor</td>
<td>3</td>
<td>3.5</td>
</tr>
<tr>
<td>Word processor/presentation</td>
<td>1</td>
<td>1.2</td>
</tr>
<tr>
<td>Course management</td>
<td>11</td>
<td>12.9</td>
</tr>
<tr>
<td>No website</td>
<td>33</td>
<td>38.8</td>
</tr>
<tr>
<td>HTML editor and word</td>
<td>6</td>
<td>7.1</td>
</tr>
<tr>
<td>processor/presentation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HTML editor and course manage</td>
<td>3</td>
<td>3.5</td>
</tr>
<tr>
<td>HTML editor and other</td>
<td>1</td>
<td>1.2</td>
</tr>
<tr>
<td>Word processor/presentation and course management</td>
<td>6</td>
<td>7.1</td>
</tr>
<tr>
<td>HTML editor, word</td>
<td>17</td>
<td>20.0</td>
</tr>
<tr>
<td>processor/presentation, and course management</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HTML editor, word</td>
<td>3</td>
<td>3.5</td>
</tr>
<tr>
<td>processor/presentation, course management and other</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HTML editor, course management</td>
<td>1</td>
<td>1.2</td>
</tr>
<tr>
<td>and other</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>85</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 6: Types of Software Used or Planned to Use for Website Creation and Management
Types of Software Used or Plan to Use for Website Creation and Management

The data presented on Table 6 shows that 20% of agricultural teacher educators used a combination of HTML editor (e.g. FrontPage, Dream Weaver), Word processor/presentation packages, and course management (e.g. WebCt and Blackboard) for website creation and management. Furthermore, 13% of agricultural teacher educators reported using course management tools for website creation, 4% used HTML editors, and 1.2% used Word processor/presentation packages.

Types of Computer Operating System Used by the Agricultural Teacher Educators

Table 7 revealed that 44% of the operating system used for website creation were WinNT/Win200, 28% used Win98/WinMe, and 9% used WinXP, while 7.0% reported used Mac/OS. On the other hand, 2% indicated a combination between, WinNT/Win2000 and Mac/OS.

Description of Who Created or Maintained the Website

Data on Table 8 pointed out that 33% of agricultural teacher educators were responsible for creating their own website. However, 12% reported that website creation was done by support staff, while 7% was done by graduate/undergraduate students. Only 2%, of agricultural teacher educators reported a combination between self and graduate/undergraduate student.
<table>
<thead>
<tr>
<th>Computer operating system</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Win95 or earlier</td>
<td>4</td>
<td>4.7</td>
</tr>
<tr>
<td>Win98/WinMe</td>
<td>24</td>
<td>28.2</td>
</tr>
<tr>
<td>WinNT/Win200</td>
<td>37</td>
<td>43.5</td>
</tr>
<tr>
<td>WinXP</td>
<td>8</td>
<td>9.4</td>
</tr>
<tr>
<td>Mac</td>
<td>6</td>
<td>7.1</td>
</tr>
<tr>
<td>Win98/WinNT and WinNT/Win200</td>
<td>1</td>
<td>1.2</td>
</tr>
<tr>
<td>WinNT/Win2000 and WinXP</td>
<td>1</td>
<td>1.2</td>
</tr>
<tr>
<td>WinNT/Win2000 and Mac/OS</td>
<td>2</td>
<td>2.4</td>
</tr>
<tr>
<td>Missing</td>
<td>2</td>
<td>2.4</td>
</tr>
<tr>
<td>Total</td>
<td>85</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 7: Types of Computer Operating System Used by the Agricultural Teacher Educators
<table>
<thead>
<tr>
<th>Created/maintained web</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self</td>
<td>28</td>
<td>32.9</td>
</tr>
<tr>
<td>Graduate/undergraduate student</td>
<td>6</td>
<td>7.1</td>
</tr>
<tr>
<td>Support staff</td>
<td>10</td>
<td>11.8</td>
</tr>
<tr>
<td>Other</td>
<td>4</td>
<td>4.7</td>
</tr>
<tr>
<td>No website</td>
<td>33</td>
<td>38.8</td>
</tr>
<tr>
<td>Self and graduate/graduate student</td>
<td>2</td>
<td>2.4</td>
</tr>
<tr>
<td>Self and support staff</td>
<td>1</td>
<td>1.2</td>
</tr>
<tr>
<td>Self, graduate/undergraduate student,</td>
<td>1</td>
<td>1.2</td>
</tr>
<tr>
<td>and support staff</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>85</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 8: Responsible for Created or Maintained the Website
Section C

Description of Training Received and the Level of Participation

A description of training related to the use of web-based technology and videoconferencing to deliver distance education; where training on web-based and videoconferencing technologies was received; how many courses have been taught using distance education by the agricultural teacher educators; and a description of the level of participation that agricultural teacher educators have in using web-based technologies to deliver distance education courses is addressed in the following section.

Types of Training Received (web-based and videoconferencing technologies)

The data presented in Figure 6 showed that 52% of the agricultural teacher educators received training on the use of web-based technologies to deliver distance education, while 48% reported no training received. On the other hand, 61% reported having never received training on the use of videoconferencing technologies for delivering distance education, while 39 reported yes (Figure 7).

Description of Where Training on Web-Based and Videoconferencing Technologies was Received

Table 9 illustrated that 33% of the agricultural teacher educators received training on the use of web-based technologies by the Department of University Technology, and 27% were self-taught. Moreover, 28% of the training on how to use videoconferencing technologies for delivering distance education were provided by the Department of University Technology, and 26% were self-taught (Table 10).
Figure 6: Training on Web-Based Technologies

Figure 7: Training on Videoconferencing Technologies

99
<table>
<thead>
<tr>
<th>Where:</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nowhere</td>
<td>18</td>
<td>21.2</td>
</tr>
<tr>
<td>Self taught</td>
<td>24</td>
<td>28.2</td>
</tr>
<tr>
<td>University technology department</td>
<td>28</td>
<td>32.9</td>
</tr>
<tr>
<td>Other, specify</td>
<td>4</td>
<td>4.7</td>
</tr>
<tr>
<td>Self taught and university technology</td>
<td>6</td>
<td>7.1</td>
</tr>
<tr>
<td>department</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self taught, university technology</td>
<td>2</td>
<td>2.4</td>
</tr>
<tr>
<td>department, and other</td>
<td></td>
<td></td>
</tr>
<tr>
<td>University technology department and other</td>
<td>2</td>
<td>2.4</td>
</tr>
<tr>
<td>Self taught and other</td>
<td>1</td>
<td>1.2</td>
</tr>
<tr>
<td>Total</td>
<td>85</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 9: Where Training on Web-Based Technologies was Received
<table>
<thead>
<tr>
<th>Where</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nowhere</td>
<td>29</td>
<td>34.1</td>
</tr>
<tr>
<td>Self taught</td>
<td>22</td>
<td>25.9</td>
</tr>
<tr>
<td>University technology department</td>
<td>24</td>
<td>28.2</td>
</tr>
<tr>
<td>Other, specify</td>
<td>3</td>
<td>3.5</td>
</tr>
<tr>
<td>Self taught and university technology department</td>
<td>3</td>
<td>3.5</td>
</tr>
<tr>
<td>Self taught, university technology department, and other</td>
<td>2</td>
<td>2.4</td>
</tr>
<tr>
<td>Missing</td>
<td>2</td>
<td>2.4</td>
</tr>
<tr>
<td>Total</td>
<td>85</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 10: Where Training on Videoconferencing Technologies was Received
Level of Participation

Frequency in Quarters/Semesters that a Course has been taught Using Web-Based Technologies

The data presented on Table 11 indicates the frequency in a semester or quarter that agricultural teacher educators taught a course using web-based technologies as a component (either totally or enhanced) for distance education. Twenty-one percent of the agricultural teacher educators indicated they taught 2 to 4 times, a course during a semester or quarter, using web-based technologies (either totally or enhanced) for distance education, 20% indicated 5-10 times, 19% taught more than 10 times, and 26% never taught courses using web-based technologies.

Number of Agricultural Teacher Educators Who were Currently Participating or Previously taught in Web-Base Distance Education

Data presented in Figure 8 revealed that 74% of the agricultural teacher educators were currently participating or previously taught a course using web-based distance education, while 26% reported not participating.
<table>
<thead>
<tr>
<th>Number of courses</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>22</td>
<td>25.9</td>
</tr>
<tr>
<td>1</td>
<td>12</td>
<td>14.1</td>
</tr>
<tr>
<td>2-4</td>
<td>18</td>
<td>21.2</td>
</tr>
<tr>
<td>5-10</td>
<td>17</td>
<td>20.0</td>
</tr>
<tr>
<td>&gt;10</td>
<td>16</td>
<td>18.8</td>
</tr>
<tr>
<td>Total</td>
<td>85</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 11: Frequency of Courses that have been Taught Using Web-based Technologies

Figure 8: Number of Agricultural Teacher Educators Who are Currently Participating or Previously Taught in Web-Base Distance Education
Section D

Description of the Perceived Level of Competences

A description of the perceived level of competence or skills that agricultural teacher educators have in the use of web-based technologies is discussed in the following section.

Perceived Level of Competence

Twelve items on the questionnaire were used to measure the perceived level of competence that agricultural teacher educators possessed in the use of web-based technologies often associated with distance education.

Data presented on Table 12 shows that 44% agricultural teacher educators indicated that they were uncomfortable creating their own WWW homepage, while 42% reported they felt comfortable creating their own WWW homepage (M=3.04; SD=1.39, See Table 13). In contrast, 90% of the agricultural teacher educators indicated that they strongly agree or agree that they could create their own presentation graphics, while 7% disagreed or strongly disagreed (M=4.46; SD=0.98, See Table 13).

A clear majority (92%) of the agricultural teacher educators agreed or strongly agreed that they used e-mail for “almost all of my correspondence,” (M=4.41; SD=0.79), while 53% disagreed or strongly disagreed that they would send their “most important or confidential documents through e-mail” (M=2.79; SD=1.36, See Table 13).

A majority (76.4%) of the agricultural teacher educators agreed or strongly agreed that they could “scan images into digital files,” while 16.4% disagreed or strongly disagreed (M=3.95; SD=1.26, See Table 13). In addition, a majority (69.4%) of the
<table>
<thead>
<tr>
<th>Variable</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SA</td>
</tr>
<tr>
<td>I am comfortable creating my own WWW homepage.</td>
<td>20.0</td>
</tr>
<tr>
<td>I am comfortable creating my own presentation graphics (e.g. PowerPoint, Corel Presentations, etc.).</td>
<td>67.1</td>
</tr>
<tr>
<td>I use e-mail for almost all my correspondence.</td>
<td>54.1</td>
</tr>
<tr>
<td>I send my most important and confidential documents through e-mail.</td>
<td>16.5</td>
</tr>
<tr>
<td>I am able to scan images into digital files.</td>
<td>43.5</td>
</tr>
<tr>
<td>I am able to manipulate digital images using software (e.g. Photoshop).</td>
<td>30.6</td>
</tr>
<tr>
<td>I am able to record digital sound in my presentations.</td>
<td>21.2</td>
</tr>
<tr>
<td>I am able to incorporate digital sound in my presentations.</td>
<td>25.9</td>
</tr>
</tbody>
</table>

Table 12: Percentage of Perceived Level of Competence
Table 12: (Continued)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am familiar with the teaching methods appropriate for distance learning.</td>
<td>30.6</td>
</tr>
<tr>
<td>I could confidently deliver a course over the web. b</td>
<td>27.1</td>
</tr>
<tr>
<td>I could confidently deliver a course using a course management system (e.g. WebCT, Blackboard).</td>
<td>20.0</td>
</tr>
<tr>
<td>I am comfortable connecting a computer to the various output devices available (e.g. LCD projector and TV).</td>
<td>54.1</td>
</tr>
</tbody>
</table>

Note. SA = Strongly Agree, A = Agree, N= Neutral, D= Disagree, SD = Strongly Disagree

*a=n=85. b missing=1.2%
<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am comfortable creating my own WWW homepage.</td>
<td>3.04</td>
<td>1.39</td>
</tr>
<tr>
<td>I am comfortable creating my own presentation graphics</td>
<td>4.46</td>
<td>0.98</td>
</tr>
<tr>
<td>(e.g. PowerPoint, Corel Presentations, etc.).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I use e-mail for almost all my correspondence.</td>
<td>4.41</td>
<td>0.79</td>
</tr>
<tr>
<td>I send my most important and confidential documents through e-mail.</td>
<td>2.79</td>
<td>1.36</td>
</tr>
<tr>
<td>I am able to scan images into digital files.</td>
<td>3.95</td>
<td>1.26</td>
</tr>
<tr>
<td>I am able to manipulate digital images using software</td>
<td>3.69</td>
<td>1.28</td>
</tr>
<tr>
<td>(e.g. Photoshop).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am able to record digital sound in my presentations.</td>
<td>3.22</td>
<td>1.38</td>
</tr>
<tr>
<td>I am able to incorporate digital sound in my presentations.</td>
<td>3.41</td>
<td>1.40</td>
</tr>
<tr>
<td>I am familiar with the teaching methods appropriate for distance learning.</td>
<td>3.96</td>
<td>0.96</td>
</tr>
<tr>
<td>I could confidently deliver a course over the web.</td>
<td>3.51</td>
<td>1.31</td>
</tr>
<tr>
<td>I could confidently deliver a course using a course management system (e.g. WebCT, Blackboard).</td>
<td>3.35</td>
<td>1.28</td>
</tr>
</tbody>
</table>

Table 13: Mean and Standard Deviation of Perceived Level of Competence
Table 13: (Continued)

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am comfortable connecting a computer to the various output devices available (e.g. LCD projector and TV).</td>
<td>4.28</td>
<td>1.01</td>
</tr>
</tbody>
</table>

Note. 1 = Strongly Disagree; 5 = Strongly Agree.

*n=85.

agricultural teacher educators agreed or strongly agreed that they could “manipulate digital images using software (e.g. Photoshop),” while 21.2% disagreed or strongly disagreed ($M=3.69; SD=1.28$, See Table 13).

Furthermore, data presented in Table 12 indicated that most of the agricultural teacher educators would agree (31.8%) or strongly agree (21.2%) with the statement, “I am able to record digital sound in my presentations.” ($M=3.22, SD=1.38$, See Table 13).

In addition, a majority (61.2%) of the agricultural teacher educators agreed or strongly agreed with the statement, “I am able to incorporate digital sound in my presentations,” while 33% disagreed or strongly disagreed ($M=3.41, SD=1.40$, See Table 13).

More than half (78%) of the respondents agreed or strongly agreed with the statement, “I am familiar with the teaching methods appropriate for distance learning.” Approximately 11% were disagreed or strongly disagreed with the statement ($M=3.96, SD=0.96$, See Table 13).
A majority (59%) of the agricultural teacher educators agreed or strongly agreed with the statement, “I could confidently deliver a course over the web” (M=3.51, SD=1.31, See Table 13). Furthermore, 53% of the agricultural teacher educators agreed or strongly agreed with the statement, “I could confidently deliver a course using a course management system,” while 26% disagreed or strongly disagreed (M=3.55, SD=1.28, See Table 13).

The majority (86%) of the agricultural teacher educators agreed or strongly agreed that they were able to “connect a computer to the various output devices available (LCD projector, TV, etc.)”, while only 10% disagreed or strongly disagreed (M=4.28, SD=1.01, See Table 13).
Section E

Description of the Perceived Level of Importance

A description of the perceived level of importance that web-based technologies have in teaching and learning is discussed in the following section.

Perceived Level of Importance

Twelve items were used to measure value—that is—the importance of the role agricultural teacher educators believed web-based technologies have or will have to teaching agriculture (Table 14).

An overwhelming majority (97.7%) of the agricultural teacher educators strongly agreed or agreed with the statement, “The Internet/WWW are convenient ways to access information” (M=4.73, SD=0.50, See Table 15). Seventy-eight percent agreed or strongly agreed with the statement, “Participation in listservs, threaded discussion groups, chats and other electronic communications offers great benefits” (M=4.07, SD=0.83, See Table 15). Furthermore, the respondents agreed (49.4%) and strongly agreed (28.2%) that, “Most course materials would be improved by incorporating multimedia” (M=4.01, SD=0.81, See Table 15).

Agricultural teacher educators agreed (64%) and strongly agreed (14%) that, “Animated graphics increase student interest” (M=3.85, SD=0.76), while 39% agreed and strongly agreed that, “Animated graphics increase student retention.” Nevertheless, 44% have a neutral perception on “Animated graphics increase student retention” (M=3.25, SD=0.87, See Table 15). The majority (81%) of the respondents agreed or strongly agreed that, “Students today prefer a more visual learning experience” (M=3.96, SD=0.70, See Table 15).

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<table>
<thead>
<tr>
<th>Variable*</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Internet/WWW are convenient ways to access information.</td>
<td>75.3 22.4 2.4 0.0 0.0</td>
</tr>
<tr>
<td>Participation in listservs, threaded discussions groups, chats and other electronic communications offers great benefits.</td>
<td>32.9 44.7 20.0 1.2 1.2</td>
</tr>
<tr>
<td>Web-based technologies and information will drastically alter how we teach in the next five years.</td>
<td>31.8 36.5 15.3 10.6 5.9</td>
</tr>
<tr>
<td>Web-based technologies and information will drastically alter what we teach in the next five years.</td>
<td>10.6 24.7 20. 36.5 8.2</td>
</tr>
<tr>
<td>I think most course materials would be improved by incorporating multimedia ( e.g. audio files, video files).</td>
<td>28.2 49.4 17.6 4.7 0.0</td>
</tr>
<tr>
<td>Animated graphics increase student interest</td>
<td>14.1 63.5 16.5 4.7 1.2</td>
</tr>
<tr>
<td>Animated graphics increase student retention.</td>
<td>5.9 32.9 43.5 15.3 2.4</td>
</tr>
<tr>
<td>Students today prefer a more visual learning experience.</td>
<td>18.8 62.4 15.3 3.5 0.0</td>
</tr>
</tbody>
</table>

*Table 14: Percentage of Perceived Level of Importance*
Table 14: (Continued)

<table>
<thead>
<tr>
<th>Variable*</th>
<th>Percent (%)</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SA</td>
<td>A</td>
<td>N</td>
<td>D</td>
<td>SD</td>
</tr>
<tr>
<td>Web-based technologies provide students with instantly available supplemental course and research materials.</td>
<td>38.8</td>
<td>55.3</td>
<td>2.4</td>
<td>3.5</td>
<td>0.0</td>
</tr>
<tr>
<td>It is important that I incorporate web-based technologies in the course(s) I teach.</td>
<td>24.7</td>
<td>51.8</td>
<td>14.1</td>
<td>9.4</td>
<td>0.0</td>
</tr>
<tr>
<td>Learning requires a face to face interaction between teachers and the students.</td>
<td>7.1</td>
<td>17.6</td>
<td>14.1</td>
<td>49.4</td>
<td>11.8</td>
</tr>
<tr>
<td>I am opposed to distance education based on my philosophy of teaching.</td>
<td>2.4</td>
<td>3.5</td>
<td>11.8</td>
<td>42.4</td>
<td>40.0</td>
</tr>
</tbody>
</table>

Note. SA = Strongly Agree, A = Agree, N= Neutral, D= Disagree, SD = Strongly Disagree

*n=85.
<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Internet/WWW are convenient ways to access information.</td>
<td>4.73</td>
<td>0.50</td>
</tr>
<tr>
<td>Participation in listservs, threaded discussions groups, chats and other</td>
<td>4.07</td>
<td>0.83</td>
</tr>
<tr>
<td>electronic communications offers great benefits.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Web-based technologies and information will drastically alter how we</td>
<td>3.78</td>
<td>1.18</td>
</tr>
<tr>
<td>teach in the next five years.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Web-based technologies and information will drastically alter what we</td>
<td>2.93</td>
<td>1.17</td>
</tr>
<tr>
<td>teach in the next five years.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I think most course materials would be improved by incorporating</td>
<td>4.01</td>
<td>0.81</td>
</tr>
<tr>
<td>multimedia (e.g. audio files, video files).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Animated graphics increase student interest</td>
<td>3.85</td>
<td>0.76</td>
</tr>
<tr>
<td>Animated graphics increase student retention.</td>
<td>3.25</td>
<td>0.87</td>
</tr>
<tr>
<td>Students today prefer a more visual learning experience.</td>
<td>3.96</td>
<td>0.70</td>
</tr>
<tr>
<td>Web-based technologies provide students with instantly available</td>
<td>4.29</td>
<td>0.69</td>
</tr>
<tr>
<td>supplemental course and research materials.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(table continues)

Table 15: Mean and Standard Deviation of Perceived Level of Importance

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The majority (94%) of agricultural teacher educators responded that they agreed or strongly agreed that, "Web-based technologies provide students with instantly available supplemental course and research materials." ($M=4.29$, $SD=0.69$, See Table 14 and Table 15).

Furthermore, 77% agreed or strongly agreed that, "It is important that I incorporate web-based technologies in the courses I teach" ($M=3.92$, $SD=0.88$, See Table 15). Moreover, 61.2% of the agricultural teacher educators disagreed or strongly disagreed that, "Learning requires a face to face interaction" ($M=2.59$, $SD=1.13$, See Table 15). In addition, 82.4% of the agricultural teacher educators disagreed and strongly disagreed, that "I am opposed to distance education based on my philosophy of teaching" ($M=1.86$, $SD=0.93$, See Table 15).

<table>
<thead>
<tr>
<th>Variable</th>
<th>$M$</th>
<th>$SD$</th>
</tr>
</thead>
<tbody>
<tr>
<td>It is important that I incorporate web-based technologies in the course(s) I teach.</td>
<td>3.92</td>
<td>0.88</td>
</tr>
<tr>
<td>Learning requires a face to face interaction between teachers and the students.</td>
<td>2.59</td>
<td>1.13</td>
</tr>
<tr>
<td>I am opposed to distance education based on my philosophy of teaching.</td>
<td>1.86</td>
<td>0.93</td>
</tr>
</tbody>
</table>

Note. 1 = Strongly Disagree; 5 = Strongly Agree

*n=85.
Incidentally, agricultural teacher educators' opinions were mixed concerning the effect of web-based technologies. Although agricultural teacher educators clearly agree (37%) or strongly agree (32%) with the statement, “Web-based technologies and information will drastically alter how we teach in the next five years,” \( (M=3.78, \text{ } \sigma=1.18, \text{ } \text{See Table 15}) \), agricultural teacher educators did not support the statement, “Web-based technologies and information will drastically alter what we teach in the next five years” (45% disagree or strongly disagree), \( (M=2.93, \text{ } \sigma=1.17, \text{ } \text{See Table 14 and Table 15}) \).
Section F

Description of the Perceived Availability of Infrastructure

A description of the perceived availability of infrastructure for agricultural teachers educators to use web-based technologies is discussed in the following section.

Perceived Availability of Infrastructure

Eight items were used to measure the perceived availability of infrastructure and training to determine the extent to which the campus environment supported the use of web-based technologically mediated instruction on- and off-campus (Table 16). In addition, four yes/no type questions were used to measure: (a) accessibility of the web from home and office; and, (b) awareness of the office and personnel in charge of scheduling videoconferencing (Figure 9-12).

Data presented on Figure 9 concerning the accessibility of the web from office, showed that 100% of the agricultural teacher educators indicated they were connected to electronic mail in their office, and 88% indicated they were connected at home (Figure 10). In addition, 78% of the agricultural teacher educators were aware of the office on campus for scheduling videoconferencing, and 77% were aware of the personnel responsible for scheduling videoconferencing (Figure 11 and Figure 12).

Moreover, Table 16 showed that 81.2% agreed or strongly agreed that, “The equipment needed to produce multimedia course materials is readily available to me” (M=4.07 SD=1.01, See Table 17). Furthermore, 86% of the agricultural teacher educators agreed or strongly agreed that, “The equipment needed to display multimedia course materials is readily available to me” (M=4.12 SD=0.92, See Table 17).
In addition, Table 16 pointed out that 86% of the agricultural teacher educators agreed or strongly agreed that they have “access to a classroom that is designed to support the use of multimedia teaching aids” (M=4.28 SD=0.89, See Table 17). Additionally, 72% of the agricultural teacher educators agreed or strongly agreed, that, “There are ample opportunities for faculty training on using multimedia equipment” (M=3.80 SD=1.09, See Table 17).

Furthermore, 53% of agricultural teacher educators agreed or strongly agreed that, “There are ample opportunities for faculty training on using videoconferencing equipment,” while 31% disagreed or strongly disagreed (M=3.39 SD=1.22, See Table 17). Although 20% indicated they were neutral on the statement, “There are enough faculty development workshops regarding videoconferencing,” 32% strongly disagreed or disagreed, while 48% strongly agreed or agreed (M=3.32 SD=1.21, See Table 17). Moreover, 68% of the agricultural teacher educators agreed or strongly agreed that they were “Aware of the procedures on campus, for scheduling videoconferencing” (M=3.68 SD=1.22, See Table 17).

Finally, 68% of the agricultural teacher educators agreed or strongly agreed that they “Have access to technical assistance when teaching at a distance,” while 18% disagreed or strongly disagreed (M=3.72, SD=1.22, See Table 17).
<table>
<thead>
<tr>
<th>Variable</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>The equipment needed to produce web multimedia course materials is readily available to me (e.g. computers, softwares).</td>
<td>38.8 42.4 8.2 8.2 2.4</td>
</tr>
<tr>
<td>The equipment needed to display web multimedia course materials is readily available to me (e.g. LCD projectors, computers).</td>
<td>36.5 49.4 4.7 8.2 1.2</td>
</tr>
<tr>
<td>I have access to a classroom that is designed to support the use of multimedia teaching aids.</td>
<td>49.4 36.5 8.2 4.7 1.2</td>
</tr>
<tr>
<td>There are ample opportunities for faculty training on using multimedia equipment (e.g. LCD projectors, computers).</td>
<td>28.2 43.5 10.6 15.3 2.4</td>
</tr>
<tr>
<td>There are ample opportunities for faculty training on using videoconferencing equipment.</td>
<td>21.2 31.8 16.5 25.9 4.7</td>
</tr>
<tr>
<td>There are adequate faculty development workshops regarding videoconferencing.</td>
<td>20. 28.2 20. 27.1 4.7</td>
</tr>
<tr>
<td>I have access to technical assistance when teaching at a distance.</td>
<td>29.4 38.8 14.1 9.4 8.2</td>
</tr>
</tbody>
</table>

Table 16: Percentage of the Perceived Availability of Infrastructure
Table 16: (Continued)

<table>
<thead>
<tr>
<th>Variable*</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SA</td>
</tr>
<tr>
<td>I am aware of the procedures on campus for scheduling videoconferencing.</td>
<td>27.1</td>
</tr>
</tbody>
</table>

Note. *n=85.

SA = Strongly Agree, A = Agree, N = Neutral, D = Disagree, SD = Strongly Disagree

Figure 9: Connection of E-mail and the WWW at Office
<table>
<thead>
<tr>
<th>Variable</th>
<th>$M$</th>
<th>$SD$</th>
</tr>
</thead>
<tbody>
<tr>
<td>The equipment needed to produce web multimedia course materials is readily available to me (e.g. Computers, Softwares).</td>
<td>4.07</td>
<td>1.01</td>
</tr>
<tr>
<td>The equipment needed to display web multimedia course materials is readily available to me (e.g. LCD projectors, computers).</td>
<td>4.12</td>
<td>0.92</td>
</tr>
<tr>
<td>I have access to a classroom that is designed to support the use of multimedia teaching aids.</td>
<td>4.28</td>
<td>0.89</td>
</tr>
<tr>
<td>There are ample opportunities for faculty training on using multimedia equipment (e.g. LCD projectors, computers).</td>
<td>3.80</td>
<td>1.09</td>
</tr>
<tr>
<td>There are ample opportunities for faculty training on using videoconferencing equipment.</td>
<td>3.39</td>
<td>1.22</td>
</tr>
<tr>
<td>There are adequate faculty development workshops regarding videoconferencing.</td>
<td>3.32</td>
<td>1.21</td>
</tr>
<tr>
<td>I have access to technical assistance when teaching at a distance.</td>
<td>3.72</td>
<td>1.22</td>
</tr>
<tr>
<td>I am aware of the procedures on campus for scheduling videoconferencing.</td>
<td>3.68</td>
<td>1.22</td>
</tr>
</tbody>
</table>

Note: *n=85.

1 = Strongly Disagree; 5 = Strongly Agree

Table 17: Description of the Perceived Availability of Infrastructure
Figure 10: Connection of E-mail and the WWW at Home

Figure 11: Awareness of the Office on Campus for Scheduling Videoconferencing

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Figure 12: Awareness of the Personnel Responsible for Scheduling Videoconferencing

(n=85)

No
24%

Yes
76%
Section G

Description of the Perceived Major Barriers

A description of the perceived major barriers for participating in the use of web-based technologies is discussed in the following section.

Perceived Major Barriers

Thirteen items were used to measure the perceived major barriers that agricultural teacher educators would consider that inhibit their decision to participate in web-based technologies (either totally or enhanced) for delivering distance education (Table 18).

Data presented on Table 18 identified that 56% of the agricultural teacher educators agreed or strongly agreed with the statement that, "The lack of administratively provided time, like professional development leave, to learn to use web-based technologies," inhibited agricultural teacher educators’ decision to participate in web-based technologies to deliver distance education (\(M=3.34\ SD=1.23\), See Table 19).

At the same time, more than half (59%) of the agricultural teacher educators agreed or strongly agreed that, "The lack of a reward and incentives that encourages faculty to participate in web-based distance education" (\(M=3.46\ SD=1.22\), See Table 19), inhibited agricultural teacher educators’ decision to participate in web-based technologies to deliver distance education.

Furthermore, "The lack of credit toward tenure and promotion" (50% agreed or strongly agreed), (\(M=3.20\ SD=1.22\)); "Concern about my workload" (67% agreed or strongly agreed), (\(M=3.55\ SD=1.17\)); "Lack of grants materials/expenses (funding)" (51% agreed or strongly agreed) (\(M=3.21\ SD=1.15\)); and, "Concern about the effects of
distance education technology on the quality of the courses I teach" (53% agreed or strongly agreed), \( M=3.21 \), \( SD=1.17 \) (See Table 19), were considered barriers which inhibited agricultural teacher educators to use web-based technologies.

However, 49% of the agricultural teacher educators did not consider barriers to participation in using web-based technologies for delivering distance education the statements, "The lack of administratively provided time, (i.e. not leave) during the day to attend workshops" \( M=2.89 \), \( SD=1.18 \); and 50% for, "The lack of a technological background" \( M=2.86 \), \( SD=1.33 \), (See Table 19).

Moreover, 48% of the agricultural teacher educators did not consider barriers to participation in using web-based technologies for delivering distance education the statements of "The lack of facilities designed to utilize web-based technologies" \( M=3.01 \), \( SD=1.25 \); "The lack of Institutional support" (45%), \( M=3.02 \), \( SD=1.24 \); and "The lack of faculty training" (45%), \( M=2.98 \), \( SD=1.23 \), (See Table 19). In addition, "The lack of technical support personnel provided by the institution" (50%), \( M=2.92 \), \( SD=1.22 \); and "Resistance to change" (77%), \( M=1.95 \), \( SD=.95 \) were also statements that agricultural teacher educators did not consider as barriers to participation in using web-based technologies for delivering distance education (Table 18).
<table>
<thead>
<tr>
<th>Variable*</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The lack of administratively provided time, like professional development leave, to learn to use web-based technologies.</td>
<td>17.6 38.8 9.4 28.2 5.9</td>
</tr>
<tr>
<td>The lack of a reward and incentives that encourages faculty to participate in web-based distance education.</td>
<td>21.2 37.6 12.9 22.4 5.9</td>
</tr>
<tr>
<td>The lack of administratively provided time, (i.e. not leave) during the day to attend workshops.</td>
<td>10.6 24.7 15.3 42.4 7.1</td>
</tr>
<tr>
<td>The lack of a technological background.</td>
<td>12.9 25.9 11.8 32.9 16.5</td>
</tr>
<tr>
<td>The lack of facilities designed to utilize web-based technologies.</td>
<td>14.1 27.1 10.6 40.0 7.1</td>
</tr>
<tr>
<td>The lack of Institutional support.</td>
<td>14.1 27.1 14.1 36.5 8.2</td>
</tr>
<tr>
<td>The lack of faculty training.</td>
<td>12.9 25.9 16.5 35.3 9.4</td>
</tr>
<tr>
<td>The lack of credit toward tenure and promotion.</td>
<td>12.9 36.5 16.5 23.5 9.4</td>
</tr>
<tr>
<td>The lack of technical support personnel provided by the institution.</td>
<td>8.2 34.1 9.4 37.6 10.6</td>
</tr>
<tr>
<td>Concern about my workload.</td>
<td>18.8 48.2 8.2 18.8 5.9</td>
</tr>
<tr>
<td>Resistance to change.</td>
<td>1.2 7.1 14.1 41.2 36.5</td>
</tr>
</tbody>
</table>

(table continues)

Table 18: Percentage of Perceived Major Barriers
Table 18: (Continued)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SA</td>
</tr>
<tr>
<td>Lack of grants materials/expenses (funding).</td>
<td>9.4</td>
</tr>
<tr>
<td>Concern about the effects of distance education technology on the quality of the courses I teach.</td>
<td>9.4</td>
</tr>
</tbody>
</table>

Note. *n=85. b missing=1.2%.

SA = Strongly Agree, A = Agree, N= Neutral, D= Disagree, SD = Strongly Disagree
<table>
<thead>
<tr>
<th>Barrier</th>
<th>$M$</th>
<th>$Mdn$</th>
<th>$SD$</th>
</tr>
</thead>
<tbody>
<tr>
<td>The lack of administratively provided time, like professional development leave, to learn to use web-based technologies.</td>
<td>3.34</td>
<td>4.00</td>
<td>1.23</td>
</tr>
<tr>
<td>The lack of a reward and incentives that encourages faculty to participate in web-based distance education.</td>
<td>3.46</td>
<td>4.00</td>
<td>1.22</td>
</tr>
<tr>
<td>The lack of administratively provided time, (i.e. not leave) during the day to attend workshops.</td>
<td>2.89</td>
<td>3.00</td>
<td>1.18</td>
</tr>
<tr>
<td>The lack of a technological background.</td>
<td>2.86</td>
<td>3.00</td>
<td>1.33</td>
</tr>
<tr>
<td>The lack of facilities designed to utilize web-based technologies.</td>
<td>3.01</td>
<td>3.00</td>
<td>1.25</td>
</tr>
<tr>
<td>The lack of Institutional support.</td>
<td>3.02</td>
<td>3.00</td>
<td>1.24</td>
</tr>
<tr>
<td>The lack of faculty training.</td>
<td>2.98</td>
<td>3.00</td>
<td>1.23</td>
</tr>
<tr>
<td>The lack of credit toward tenure and promotion.</td>
<td>3.20</td>
<td>4.00</td>
<td>1.22</td>
</tr>
<tr>
<td>The lack of technical support personnel provided by the institution.</td>
<td>2.92</td>
<td>3.00</td>
<td>1.22</td>
</tr>
<tr>
<td>Concern about my workload.</td>
<td>3.55</td>
<td>4.00</td>
<td>1.17</td>
</tr>
<tr>
<td>Resistance to change.</td>
<td>1.95</td>
<td>2.00</td>
<td>0.95</td>
</tr>
</tbody>
</table>

Table 19: Mean, Median and Standard Deviation of Perceived Major Barriers
Table 19: (Continued)

<table>
<thead>
<tr>
<th>Barrier*</th>
<th>M</th>
<th>Mdn</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of grants materials/expenses (funding)</td>
<td>3.21</td>
<td>4.00</td>
<td>1.15</td>
</tr>
<tr>
<td>Concern about the effects of distance education technology on the quality of the courses I teach.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. *n=85.

1 = Strongly Disagree; 5 = Strongly Agree

Section H

Relationships Among Variables

This section examines the relationship between the dependent variables (age, gender, rank, tenure status, year of teaching experience and prior experience in teaching courses using distance education, and training on web-based technologies) and the independent variables. The independent variables were divided into four categories: level of competence, level of importance, perceived availability of infrastructure, and major barriers. In order to reject or fail to reject the null hypothesis, two rules were set. First, the correlation coefficient value must have been .10 or greater. Second, the relationship must have been significant at p < .05. The descriptors identified by Davis (1971) were used to describe the measures of association between the independent variables.
**Research Objective 8a**

Describe what relationship existed between the perceived level of competence and selected personal and professional characteristics (age, gender, rank, tenure status, year of teaching experience and prior experience in teaching courses using distance education, and training on web-based technologies).

**Age and Level of Competence**

A Spearman correlation was calculated to describe the relationship between “level of competence” and “age”. A low negative association \((r = -.23)\) was found between the agricultural teacher educators “age” and their “level competence” (Table 20).

**Gender and Level of Competence**

A Point Biserial correlation was calculated to describe the relationship between “level of competence” and “gender”. A negligible association \((r = -.04)\) was found between the agricultural teacher educators’ “gender” and “level of competence” (Table 20).

**Rank and Level of Competence**

A Point Biserial correlation was calculated to describe the relationship between “level of competence” and “rank”. A low negative association \((r = -.26)\) was found between the agricultural teacher educators’ “rank” and “level of competence” (Table 20).
<table>
<thead>
<tr>
<th>Variable</th>
<th>Statistic</th>
<th>Correlation coefficient</th>
<th>Significance (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>( r_s )</td>
<td>-.23</td>
<td>.03*</td>
</tr>
<tr>
<td>Gender</td>
<td>( r_{pb} )</td>
<td>-.04</td>
<td>.68</td>
</tr>
<tr>
<td>Tenure Status</td>
<td>( r_{pb} )</td>
<td>-.20</td>
<td>.07</td>
</tr>
<tr>
<td>Years of teaching experience</td>
<td>( r_s )</td>
<td>-.12</td>
<td>.26</td>
</tr>
<tr>
<td>Training</td>
<td>( r_{pb} )</td>
<td>.13</td>
<td>.22</td>
</tr>
<tr>
<td>Academic Rank</td>
<td>( r_{pb} )</td>
<td>-.26</td>
<td>.01*</td>
</tr>
<tr>
<td>Prior experience</td>
<td>( r_{pb} )</td>
<td>.34</td>
<td>.00*</td>
</tr>
</tbody>
</table>

Note. *n=85.

* Correlation is significant at the 0.05 level (2-tailed).

\( r_s \) = Spearman Correlation Coefficient

\( r_{pb} \) = Point Biserial Correlation Coefficient

Table 20: Relationship between Level of Competence and Demographics Variables
Year of Teaching Experience and Level of Competence

A Spearman correlation was calculated to describe the relationship between “level of competence” and “year of teaching experience”. A low negative association ($r = -.12$) was found between agricultural teacher educator’s “year of teaching experience” and “level of competence” (Table 20).

Prior Experience in Teaching Courses Using Distance Education and Level of Competence

A Point Biserial correlation was calculated to describe the relationship between “level of competence” and “prior experience” in teaching courses using distance education. A moderate positive association ($r = .34$) was found between “level of competence” and “prior experience” in teaching courses using distance education (Table 20).

Training on web-based technologies and Level of Competence

A Point Biserial correlation was calculated to describe the relationship between “level of competence” and “training on web-based technologies”. A low positive association ($r = .13$) was found between “level of competence” and “training on web-based technologies” (Table 20).

Research Hypothesis 8a

There was no relationship between the perceived level of competence and selected personal and professional characteristics (age, gender, rank, tenure status, year of teaching experience and prior experience in teaching courses using distance education, and training on web-based technologies).
Age and Level of Competence

The research hypothesis was tested in its null form. A low negative association existed between “age” and “level of competence.” Table 20 shows that the Spearman-product moment correlation coefficient was -.23. The statistical hypothesis of no relationship was rejected at alpha = .05; it was concluded that in the population of agricultural teacher educators there was a significant low negative relationship between “level of competence” and “age.”

Gender and Level of Competence

A negligible association existed between “gender” and “level of competence.” Since in order to reject or fail to reject the null hypothesis, two rules were set a priori. First, the correlation coefficient value must have been .10 or greater. Second, the relationship must have been significant at $p < .05$. Table 20 shows that the Point Biserial correlation coefficient was -.04, therefore, “gender” and “level of competence” violated the previous rules.

Rank and Level of Competence

The research hypothesis was tested in its null form. A low negative association existed between “rank” and “level of competence.” Table 20 shows that the Point-Biserial correlation coefficient was -.26. The statistical hypothesis of no relationship was rejected at alpha = .05; it was concluded that in the population of agricultural teacher educators there was a significant low negative relationship between “level of competence” and “rank.”
Tenure Status and Level of Competence

The research hypothesis was tested in its null form. A low negative association existed between “tenure status” and “level of competence.” Table 20 shows that the Point-Biserial correlation coefficient was -.20. The statistical hypothesis of no relationship was not rejected at alpha = .05; it was concluded that in the population of agricultural teacher educators there was a not significant relationship between “level of competence” and “tenure status.”

Year of Teaching Experience and Level of Competence

The research hypothesis was tested in its null form. A low negative association existed between “year of teaching experience” and “level of competence.” Table 20 shows that the Spearman correlation coefficient was -.12. The statistical hypothesis of no relationship was not rejected at alpha = .05; it was concluded that in the population of agricultural teacher educators there was no significant relationship between “level of competence” and “year of teaching experience.”

Prior Experience in Teaching Courses Using Distance Education and Level of Competence

The research hypothesis was tested in its null form. A moderate positive association existed between “prior experience in teaching courses using distance education” and “level of competence.” Table 20 shows that the Point-Biserial correlation coefficient was .34. The statistical hypothesis of no relationship was rejected at alpha = .05; it was concluded that in the population of agricultural teacher educators there was a significant moderate positive relationship between “level of competence” and “prior experience in teaching courses using distance education.”
Training on Web-Based Technologies and Level of Competence

The research hypothesis was tested in its null form. A low positive association existed between “training on web-based technologies” and “level of competence.” Table 20 shows that the Point-Biserial correlation coefficient was .13. The statistical hypothesis of no relationship was not rejected at alpha = .05; it was concluded that in the population of agricultural teacher educators there was not significant relationship between “level of competence” and “training on web-based technologies.”

Research Objective 8b

What relationship existed between the perceived level of importance and selected personal and professional characteristics (age, gender, rank, tenure status, year of teaching experience and prior experience in teaching courses using distance education, and training on web-based technologies)?

Age and Level of Importance

A Spearman correlation was calculated to describe the relationship between “level of importance” and “age”. A low positive association ($r = .21$) was found between the agricultural teacher educators’ “age” and their “level of importance” (Table 21).

Gender and Level of Importance

A Point Biserial correlation was calculated to describe the relationship between “level of importance” and “gender”. A low negative association ($r = -.10$) was found between the agricultural teacher educators’ “gender” and “level of importance” (Table 21).
<table>
<thead>
<tr>
<th>Variable</th>
<th>Statistic</th>
<th>Correlation coefficient</th>
<th>Significance (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>$r_s$</td>
<td>0.21</td>
<td>0.05</td>
</tr>
<tr>
<td>Gender</td>
<td>$r_{pb}$</td>
<td>-0.10</td>
<td>0.37</td>
</tr>
<tr>
<td>Tenure Status</td>
<td>$r_{pb}$</td>
<td>0.03</td>
<td>0.78</td>
</tr>
<tr>
<td>Years of teaching experience</td>
<td>$r_s$</td>
<td>0.26</td>
<td>0.01*</td>
</tr>
<tr>
<td>Training</td>
<td>$r_{pb}$</td>
<td>0.05</td>
<td>0.63</td>
</tr>
<tr>
<td>Academic Rank</td>
<td>$r_{pb}$</td>
<td>-0.01</td>
<td>0.89</td>
</tr>
<tr>
<td>Prior experience</td>
<td>$r_{pb}$</td>
<td>-0.03</td>
<td>0.75</td>
</tr>
</tbody>
</table>

Note. *n=85.

* Correlation is significant at the 0.05 level (2-tailed).

$r_s$ = Spearman Correlation Coefficient

$r_{pb}$ = Point Biserial Correlation Coefficient

Table 21: Relationship between Level of Importance and Demographics Variables
Rank and Level of Importance

A Point Biserial correlation was calculated to describe the relationship between “level of importance” and “rank”. A negligible association \( r = -0.01 \) was found between the agricultural teacher educators’ “rank” and “level of importance” (Table 21).

Tenure status and Level of Importance

A Point Biserial correlation was calculated to describe the relationship between “level of importance” and “tenure”. A negligible association \( r = -0.03 \) was found between the agricultural teacher educators’ “tenure status” and “level of importance” (Table 21).

Year of Teaching Experience and Level of Importance

A Spearman correlation was calculated to describe the relationship between “level of importance” and “years of teaching experience”. A low negative association \( r = -0.26 \) was found between agricultural teacher educators’ “years of teaching experience” and “level of importance” (Table 21).

Prior Experience in Teaching Courses Using Distance Education and Level of Importance

A Point Biserial correlation was calculated to describe the relationship between “level of importance” and “prior experience” in teaching courses using distance education. A negligible association \( r = -0.03 \) was found between agricultural teacher educators’ “level of importance” and “prior experience” in teaching courses using distance education (Table 21).
Training on Web-Based Technologies and Level of Importance

A Point Biserial correlation was calculated to describe the relationship between “level of importance” and “training on web-based technologies”. A negligible association ($r = -.05$) was found between agricultural teacher educators’ “level of importance” and “training on web-based technologies” (Table 21).

Research Hypothesis 8b

There was no relationship between the perceived level of importance and selected personal and professional characteristics (age, gender, rank, tenure status, year of teaching experience and prior experience in teaching courses using distance education, and training on web-based technologies).

Age and Level of Importance

The research hypothesis was tested in its null form. A low positive association existed between “age” and “level of importance.” Table 21 shows that the Spearman-product moment correlation coefficient was .21. The statistical hypothesis of no relationship was not rejected at alpha = .05; it is concluded that in the population of agricultural teacher educators there is not significant relationship between “level of importance” and “age.”

Gender and Level of Importance

The research hypothesis was tested in its null form. A low negative association existed between “gender” and “level of importance.” Table 21 shows that the Point-Biserial correlation coefficient was -.10. The statistical hypothesis of no relationship was
not rejected at alpha = .05; it was concluded that in the population of agricultural teacher educators there was not significant relationship between “level of importance” and “gender”.

Rank and Level of Importance

The research hypothesis was tested in its null form. A negligible association existed between “rank” and “level of importance”. In order to reject or fail to reject the null hypothesis, two rules were set. First, the correlation coefficient value must have been .10 or greater. Second, the relationship must have been significant at $p < .05$. Table 21 shows that the Point-Biserial correlation coefficient was -.01. Therefore, “level of importance” and “rank” violated the previous rules.

Tenure status and Level of Importance

A negligible association existed between “tenure status” and “level of importance.” In order to reject or fail to reject the null hypothesis, two rules were set. First, the correlation coefficient value must have been .10 or greater. Second, the relationship must have been significant at $p < .05$. Table 21 shows that the Point-Biserial correlation coefficient was .03. Therefore, “level of importance” and “tenure status” violated the previous rules.

Year of Teaching Experience and Level of Importance

The research hypothesis was tested in its null form. A positive low association existed between “year of teaching experience” and “level of importance.” Table 21 shows that the Spearman correlation coefficient was .25. The statistical hypothesis of no
relationship was rejected at alpha = .05; it was concluded that in the population of agricultural teacher educators there was a significant positive low relationship between “level of importance” and “year of teaching experience.”

Prior Experience in Teaching Courses Using Distance Education and Level of Importance

A negligible association existed between “prior experience in teaching courses using distance education” and “level of importance.” In order to reject or fail to reject the null hypothesis, two rules were set. First, the correlation coefficient value must have been .10 or greater. Second, the relationship must have been significant at $p < .05$. Table 21 shows that the Point-Biserial correlation coefficient was .03. Therefore, “prior experience in teaching courses using distance education” and “level of importance” violated the previous rules.

Training on Web-Based Technologies and Level of Importance

A negligible association existed between “training on web-based technologies” and “level of importance.” In order to reject or fail to reject the null hypothesis, two rules were set. First, the correlation coefficient value must have been .10 or greater. Second, the relationship must have been significant at $p < .05$. Table 21 shows that the Point-Biserial correlation coefficient was .05. Therefore, “level of competence” and “training on web-based technologies” violated the previous rules.
Research Objective 8c

What relationship existed between the perceived availability of infrastructure, and level of competence?

A Pearson-product moment correlation was calculated to describe the relationship between availability of infrastructure, and level of competence. A positive moderate association \((r = .30)\) was found between agricultural teacher educators' perception on the availability of infrastructure and level of competence (Table 22).

Research Hypothesis 8c

There was no relationship between the perceived availability of infrastructure and level of competence.

The research hypothesis was tested in its null form. A positive moderate association existed between availability of infrastructure and level of competence. Table 22 shows that the Pearson-product moment correlation was .30. The statistical hypothesis of no relationship was rejected at alpha = .05; it was concluded that in the population of agricultural teacher educators there was a significant positive moderate relationship between "availability of infrastructure" and "level of competence."
<table>
<thead>
<tr>
<th>Variable</th>
<th>Statistic</th>
<th>Correlation Coefficient</th>
<th>Significance ($p$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level of competence</td>
<td>$r$</td>
<td>.30</td>
<td>.00*</td>
</tr>
</tbody>
</table>

Note. *$n=85$*

* Correlation is significant at the 0.05 level (2-tailed).

$r = \text{Pearson Product Moment Correlational Coefficient}$

Table 22: Relationship between the Perceived Availability of Infrastructure and Level of Competence

**Research Objective 8d**

What relationship existed between the perceived availability of infrastructure and level of importance?

A Pearson-product moment correlation was calculated to describe the relationship between availability of infrastructure and level of importance. A positive moderate association ($r = .30$) was found between agricultural teacher educators' perception on the availability of infrastructure and level of importance (Table 23).

**Research Hypothesis 8d**

There was no relationship between the perceived availability infrastructure and level of importance.

The research hypothesis was tested in its null form. A positive moderate association existed between availability infrastructure, and level of importance. Table 23 shows that the Pearson-product moment correlation was .30. The statistical hypothesis of
no relationship was rejected at alpha = .05; it was concluded that in the population of agricultural teacher educators there was a significant positive moderate relationship between "availability of infrastructure" and "level of importance."

<table>
<thead>
<tr>
<th>Variable*</th>
<th>Statistic</th>
<th>Correlation coefficient</th>
<th>Significance (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level of importance</td>
<td>( r )</td>
<td>.30</td>
<td>.00*</td>
</tr>
</tbody>
</table>

Note. *n=85.

* Correlation is significant at the 0.05 level (2-tailed).

\( r = \) Pearson Product Moment Correlational Coefficient

---

**Research Objective 8e**

What relationship existed between the major barriers and the level of importance?

A Pearson-product moment correlation was calculated to describe the relationship between the perceived major barriers and level of importance. A low negative association (\( r = -.16 \)) was found between “lack of professional development leave,” “lack of reward and incentives” (\( r = -.26 \)), “lack of credit toward promotion” (\( r = -.23 \)), and “level of importance” (See Table 24). Moreover, a negligible association (\( r = -.08 \)) was
<table>
<thead>
<tr>
<th>Variable</th>
<th>Statistic</th>
<th>Correlation coefficient</th>
<th>Significance (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The lack of professional development leave.</td>
<td>r</td>
<td>-.16</td>
<td>.13</td>
</tr>
<tr>
<td>The lack of a reward and incentives.</td>
<td>r</td>
<td>-.26</td>
<td>.01*</td>
</tr>
<tr>
<td>The lack of credit toward tenure and promotion.</td>
<td>r</td>
<td>-.23</td>
<td>.03*</td>
</tr>
<tr>
<td>Concern about my workload.</td>
<td>r</td>
<td>-.08</td>
<td>.41</td>
</tr>
<tr>
<td>Lack of grant materials/expenses (funding).</td>
<td>r</td>
<td>-.02</td>
<td>.83</td>
</tr>
<tr>
<td>Concern about the effects of distance education technology on the quality of the courses.</td>
<td>r</td>
<td>-.01</td>
<td>.88</td>
</tr>
</tbody>
</table>

Note. *n=85.

* Correlation is significant at the 0.05 level (2-tailed).

*r = Pearson Product Moment Correlational Coefficient

Table 24: Relationship between Identified Major Barriers and Level of Importance
found between “concern about workload,” “lack of grants material/expenses (funding)” 
\( r = -.02 \), “concern about the effect of distance education technology on the quality of 
courses” \( r = -.01 \), and “level of importance” (Table 24).

**Research Hypothesis 8e**

There was no relationship between the major barrier (“lack of professional development leave”) and the “level of importance”.

The research hypothesis was tested in its null form. A low negative association existed between “lack of professional development leave” and “level of importance.” Table 24 shows Pearson-product moment correlation was -.17. The statistical hypothesis of no relationship was not rejected at alpha = .05; it was concluded that in the population of agricultural teacher educators there was not significant relationship between “lack of professional development leave” and “level of importance.”

**Research Hypothesis 8e**

There was no relationship between the major barrier (“lack reward and incentives”) and the “level of importance”.

The research hypothesis was tested in its null form. A low negative association existed between “lack reward and incentives” and “level of importance.” Table 24 shows that the Pearson-product moment correlation was -.26. The statistical hypothesis of no relationship was rejected at alpha = .05; it was concluded that in the population of agricultural teacher educators there was a significant low negative relationship between “lack reward and incentives” and “level of importance.”

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Research Hypothesis 8e

There was no relationship between the major barrier ("lack of credit toward tenure and promotion") and the "level of importance".

The research hypothesis was tested in its null form. A low negative association existed between "lack of credit toward tenure and promotion" and "level of importance." Table 24 shows Pearson-product moment correlation was -.23. The statistical hypothesis of no relationship was rejected at alpha = .05; it was concluded that in the population of agricultural teacher educators there was a significant low negative relationship between "lack of credit toward tenure and promotion" and "level of importance."

Research Hypothesis 8e

There was no relationship between the major barrier ("concern about workload") and the "level of importance".

A negligible association existed between "concern about workload" and "level of importance." In order to reject or fail to reject the null hypothesis, two rules were set. First, the correlation coefficient value must have been .10 or greater. Second, the relationship must have been significant at \( p < .05 \). Table 24 shows that the Pearson-product moment correlation was -.08. Therefore, "concern about workload" and "level of importance" violated the previous rules.
Research Hypothesis 8e

There was no relationship between the major barrier ("lack of grants materials/expenses (funding)") and the "level of importance".

A negligible association existed between "lack of grants materials/expenses (funding)" and "level of importance". In order to reject or fail to reject the null hypothesis, two rules were set. First, the correlation coefficient value must have been .10 or greater. Second, the relationship must have been significant at \( p < .05 \). Table 24 shows that the Pearson-product moment correlation was -.02. Therefore, "lack of grants materials/expenses (funding)" and "level of importance" violated the previous rules.

Research Hypothesis 8e

There was no relationship between the major barrier ("concern about the effect of distance education technology on the quality of courses") and the "level of importance".

A negligible association existed between "concern about the effect of distance education technology on the quality of courses" and "level of importance". In order to reject or fail to reject the null hypothesis, two rules were set. First, the correlation coefficient value must have been .10 or greater. Second, the relationship must have been significant at \( p < .05 \). Table 24 shows that the Pearson-product moment correlation was -.01. Therefore, "concern about the effect of distance education technology on the quality of courses" and "level of importance" violated the previous rules.
Research Objective 8f

What relationship existed between the identified major barriers and the level of competence?

A Pearson-product moment correlation was calculated to describe the relationship between the perceived major barriers and level of competence. A low negative association was found between “lack of professional development leave” \( (r = -.18) \), “lack of reward and incentives” \( (r = -.16) \), “lack of credit toward promotion” \( (r = -.15) \), “concern about workload” \( (r = -.23) \), “lack of grants material/expenses (funding)” \( (r = -.12) \), and “level of competence” (Table 25).

Moreover, a negligible association \( (r = -.07) \) was found between “concern about the effect of distance education technology on the quality of courses” \( (r = -.07) \), and “level of competence” (Table 25).

Research Hypothesis 8f

There was no relationship between the major barrier (“lack of professional development leave”) and the “level of competence”.

The research hypothesis was tested in its null form. A low negative association existed between “lack of professional development leave” and “level of competence.” Table 25 shows that the Pearson-product moment correlation was -18. The statistical hypothesis of no relationship was not rejected at alpha = .05; it was concluded that in the population of agricultural teacher educators there was not significant relationship between “lack of professional development leave” and “level of competence.”

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<table>
<thead>
<tr>
<th>Variable*</th>
<th>Statistic</th>
<th>Correlation coefficient</th>
<th>Significance (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The lack of professional development leave.</td>
<td>$r$</td>
<td>-.18</td>
<td>.09</td>
</tr>
<tr>
<td>The lack of a reward and incentives.</td>
<td>$r$</td>
<td>-.16</td>
<td>.13</td>
</tr>
<tr>
<td>The lack of credit toward tenure and promotion.</td>
<td>$r$</td>
<td>-.14</td>
<td>.18</td>
</tr>
<tr>
<td>Concern about my workload.</td>
<td>$r$</td>
<td>-.23</td>
<td>.03*</td>
</tr>
<tr>
<td>Lack of grant materials/expenses (funding).</td>
<td>$r$</td>
<td>-.12</td>
<td>.25</td>
</tr>
<tr>
<td>Concern about the effects of distance education technology on the quality of the courses.</td>
<td>$r$</td>
<td>.07</td>
<td>.51</td>
</tr>
</tbody>
</table>

Note. *n=85

* Correlation is significant at the 0.05 level (2-tailed).

$r$ = Pearson Product Moment Correlational Coefficient

Table 25: Relationship between Identified Major Barriers and Level of Competence
Research Hypothesis 8f

There was no relationship between the major barriers ("lack reward and incentives") and the "level of competence".

The research hypothesis was tested in its null form. A low negative association existed between "lack reward and incentives" and "level of competence." Table 25 shows that the Pearson-product moment correlation was -0.16. The statistical hypothesis of no relationship was not rejected at alpha = 0.05; it was concluded that in the population of agricultural teacher educators there was not a significant relationship between "lack reward and incentives" and "level of competence".

Research Hypothesis 8f

There was no relationship between the major barrier ("lack of credit toward tenure and promotion") and the "level of competence".

The research hypothesis was tested in its null form. A low negative association existed between "lack of credit toward tenure and promotion" and "level of competence." Table 25 shows that the Pearson-product moment correlation was -0.15. The statistical hypothesis of no relationship was not rejected at alpha = 0.05; it was concluded that in the population of agricultural teacher educators there was not significant relationship between "lack of credit toward tenure and promotion" and "level of competence."
Research Hypothesis 8f

There was no relationship between the major barrier ("concern about workload") and the "level of competence".

The research hypothesis was tested in its null form. A low negative association existed between "concern about workload" and "level of competence." Table 25 shows that the Pearson-product moment correlation was -.23. The statistical hypothesis of no relationship was rejected at alpha = .05; it was concluded that in the population of agricultural teacher educators there was a significant low negative relationship between "concern about workload" and "level of importance."

Research Hypothesis 8f

There was no relationship between the major barrier ("lack of grants materials/expenses (funding)") and the level of competence.

The research hypothesis was tested in its null form. A low negative association existed between "lack of grants materials/expenses (funding)" and "level of competence." Table 25 shows that the Pearson-product moment correlation was -.12. The statistical hypothesis of no relationship was not rejected at alpha = .05; it was concluded that in the population of agricultural teacher educators there was not significant relationship between "lack of grants materials/expenses (funding)" and "level of competence."
Research Hypothesis 8f

There was no relationship between the major barrier ("concern about the effect of distance education technology on the quality of courses") and the "level of competence".

A negligible association existed between "concern about the effect of distance education technology on the quality of courses" and "level of competence." In order to reject or fail to reject the null hypothesis, two rules were set. First, the correlation coefficient value must have been .10 or greater. Second, the relationship must have been significant at \( p < .05 \). Table 25 shows that the Pearson-product moment correlation was -.07. Therefore, "concern about the effect of distance education technology on the quality of courses" and "level of importance." violated the previous rules.

Section I

Multiple Regression Procedures

Multiple regression analysis procedures explain the variability of a dependent variable (faculty participation in web-based distance education) by using information available on two or more independent variables (Warmbrod, 1993). The nominal variables (categorical) were dummy coded as 1 and 0 for the regression analysis procedures. As recommended by Warmbrod (1993), dummy variables were generated, therefore; each dummy variable membership in a given group (or category) was indicated by 1 while no membership in the group (or category) was indicated by 0. Therefore, mean scores for those variables represented a proportion of the group rather than the mean scores.
As stated earlier, two rules were set a priori. First, in order for the variable to be considered for further analysis in the multiple regression procedure, it must have had a correlation value of .10 or higher. Second, it must have had a significant relationship with faculty participation in web-based distance education. The three (3) variables that were found to be significantly correlated with faculty participation in web-based distance education were: infrastructure; competences/skills; and, lack of grant material/expenses (funding) (Table 26).

**Procedure for Entering Independent Variables**

Table 27 shows the results of the regression analysis procedures. For this investigation, a simultaneous model was used since it is most appropriate when there is no logical or theoretical basis for considering any independent variable prior to any other independent variables (Warmbrod, 1993 and Stevens, 1992). All independent variables were treated simultaneously and entered into the regression equation in a single step.

Table 27 reveals that from three independent variables, only two variables were significant. These two variables were: competences/skills; and, lack of grants material/expenses (funding).

**Proportion of the Variance in Faculty Participation in Web-Based Distance Education**

The proportion of the variance ($\text{sr}^2$) in the dependent variable that was uniquely explained by each independent variable after removing the linear effects of the other independent variables was calculated (Stevens, 1992). This procedure was done by (1)
calculating the proportion of the variance ($R^2$) in the full model accounted for by all the independent variables, and (2) determining the proportion of variance uniquely accounted for by the independent variable of interest ($sr^2$).

The proportion of variance uniquely accounted for by the independent variable of interest ($sr^2$) was determined by subtracting the squared multiple correlation coefficient ($R^2$) of the other independent variables from the full model. This is shown in the formula given by Cohen and Cohen (1975):

$$sr^2 = R^2 - R_i^2$$

(1)

In testing whether an independent variable of interest made a significantly nonzero unique contribution to the multiple $R^2$, the t-test was used. The formula for the t-test given by Cohen and Cohen (1975) was as follows:

$$t_i = sr_i \frac{n - K - 1}{1 - R^2}$$

(2)

The two independent variables that were included in the calculation of the semipartial multiple regression coefficients accounted for 33% of the faculty participation in web-based distance education.
The independent variable, competences/skills, uniquely accounted for 27.1% of the variance in faculty participation in web-based distance education when the effect of the other independent variables were removed. The t-test value was 5.79 and it was significant at $p < .05$ (see Table 27).

The independent variable, lack of grants materials/expenses (funding), uniquely accounted for 3.4% of the variance in faculty participation in web-based distance education, when the effect of the other independent variables were removed. The t-test value was $-2.05$ and it was significant at $p < .05$ (Table 27).

**Equation for Predicting Faculty Participation in Web-Based Distance Education**

As stated earlier, a simultaneous multiple regression procedure was used to develop regression equations for predicting faculty participation in web-based distance education. The independent variables that were significantly related to faculty participation in web-based distance education were included in the analysis. The best predictors of faculty participation in web-based distance education were found to competences/skills and lack of grant material/expenses (funding).
### Table 26: Regression of Faculty Participation in Web-Based Distance Education on Selected Variables

<table>
<thead>
<tr>
<th>Variables*</th>
<th>$sr^2$</th>
<th>$b$</th>
<th>$t$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competences/skills ($X_1$)</td>
<td>.271</td>
<td>.909</td>
<td>5.79</td>
<td>.000*</td>
</tr>
<tr>
<td>Lack of grant material/expenses (funding) ($X_2$)</td>
<td>.034</td>
<td>-.239</td>
<td>-2.05</td>
<td>.043*</td>
</tr>
<tr>
<td>Infrastructure ($X_3$)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Faculty participation ($Y$)</td>
<td>1.00</td>
<td>2.91</td>
<td></td>
<td>1.46</td>
</tr>
</tbody>
</table>

Note: *n=85. *Significant at .05.

Standard error = 1.21, Multiple $R (R^2)=.335$, Adjusted $R^2 = .319$, $sr^2$ = Square Semi-partial coefficient, For model: $F= 20.68; p<.000$, *$p<.05$
Although the variable of infrastructure had significant correlations with faculty participation in web-based distance education, when the variable was entered to the equation, the variable of infrastructure did not significantly contribute to the prediction of faculty participation in web-based distance education. These results are shown on Table 27.

The equation for predicting faculty participation in web-based distance education was found to be as follows:

\[ Y' = a + b_1x_1 + b_2x_2 \]  

\[ Y' \text{ (faculty participation)} = .345 + (.909)(\text{competences/skills}) -(.239) \text{ (lack of material/expenses (funding))} \]

The variables in the equation represent the independent variables which best predict the faculty participation in web-based distance education. These variables accounted for 33% of the variance in faculty participation in web-based distance education \((R^2 = .33)\). The model is significant in predicting faculty participation in web-based distance education.

**Summary**

The regression analysis showed that the most powerful variables in predicting faculty participation in web-based distance education were: competences/skills and lack of grant material/expenses (funding). Although the variable of infrastructure and faculty participation in web-based distance education was correlated, the variable of
infrastructure did not significantly contribute to the prediction of faculty participation in web-based distance education with this population. Finally, 67% of the variance in faculty participation in web-based distance education was still unexplained.
CHAPTER 5

SUMMARY, CONCLUSION, AND RECOMMENDATIONS

This chapter is divided into the following sections: (1) Problem statement, (2) Purpose and Objectives, (3) Population, (4) Methodology, including research design, instrumentation, data collection and data analysis, (5) Summary of Findings and Conclusions, (6) Recommendations.

**Problem Statement**

Distance education uses communication technologies, such as web-based technology, to link vast arrays of resources and makes technologies available to stimulate and support the development of learning skills (Brooks, 1999). However, more information is needed about the distance-learning environment thus that faculty, administrators, institutions, and students can be successful in that setting. Therefore, institutions of higher education have become obligated to reexamine information technology as a tool for increasing the academic and administrative potential of faculty, staff, and students. Even though an increasing amount of research is being conducted in the field of distance education, most current research into distance learning has focused on
the students, the curriculum, and the technology (Dillon & Walsh, 1992; Purdy & Wright, 1992). However, Beaudoin (1990) argued that the importance of the faculty as a group has been largely neglected by much of the current research.

The problem was that there was insufficient information to clarify factors which influenced faculty participation in web-based distance education for delivering instruction in agricultural programs. In order to improve facilitation of faculty involvement in web-based distance education, it was necessary to study and determine what factors influenced faculty members' to participate in web-based distance education from a faculty perspective. Because of the limited research regarding the factors influencing faculty participation in web-based distance education, an in-depth study to identify those factors was appropriate. Faculty level of competence, level of importance, availability of infrastructure, training and major barriers faced in using web-based distance education technologies can provide important information to use in sustaining faculty members and in helping distance education programs achieve higher levels of efficiency and effectiveness.

Purpose of the Study

The purpose of this descriptive-correlational study was to investigate factors which influenced faculty participation in web-based distance education for delivering instruction in agricultural programs at a land grant institution. In addition, the study sought to discuss faculty perceptions on their level of competence, level of importance, availability of infrastructure, training, and perceived major barriers faced in using web-based distance education technologies for delivering instruction in agriculture programs.
To guide the study, the following research objectives were investigated:

1. Describe the selected personal and professional characteristics (age, gender, tenure status, and years of teaching experience, teaching load, academic rank, and region of agricultural teacher educators (faculty).

2. Describe how many of the faculty had a website, how used, where the course website resided, software used, computer operating system used, and who created or maintained the website.

3. Describe training related to the use of web-based and videoconferencing technology to deliver distance education, where training on web-based and videoconferencing technologies were received, how many courses have been taught using web-based distance education by the agricultural teacher educators, and level of participation using web-based distance education technologies.

4. Describe what was the perceived level of competence that agricultural teacher educators have in the use of web-based technologies.

5. Describe agricultural teacher educators perceptions of the level of importance of web-based technologies have or will have in teaching and learning.

6. Determine the perceived availability of infrastructure for agricultural teacher educators to use web-based technologies.

7. Describe what the agricultural teacher educators perceived as major barriers for participating in the use of web-based technologies for delivering distance instruction in agricultural settings.
8. Describe what relationship existed between:

a. The perceived level of competence and selected personal and professional characteristics (age, gender, rank, tenure status, year of teaching experience and prior experience in teaching courses using distance education, and training).

b. The perceived level of importance and selected personal and professional characteristics (age, gender, rank, tenure status, year of teaching experience and prior experience in teaching courses using distance education, and training).

c. The perceived availability of infrastructure, and level of competence.

d. The perceived availability of infrastructure, and level of importance.

e. The identified major barriers and the level of importance.

f. The identified major barriers and the level of competence.

9. Explain the variance in the dependent variable, faculty participation in web-based distance education, through a linear combination of the independent variables.

The following research hypotheses were generated for question #8

a. There is no relationship between the perceived level of competence and selected personal and professional characteristics (age, gender, rank, tenure status, year of teaching experience and prior experience in teaching courses using distance education, and training).
b. There is no relationship between the perceived level of importance and selected personal and professional characteristics (age, gender, rank, tenure status, year of teaching experience and prior experience in teaching courses using distance education, and training).

c. There is no relationship between the perceived availability of equipment, facilities, and level of competence.

d. There is no relationship between the perceived availability of equipment, facilities, and level of importance.

e. There is no relationship between the major barriers and the level of importance.

f. There is no relationship between the major barriers and the level of competence.

Population

The target population for the current study was agricultural teacher educators. The accessible population for this study was agricultural teacher educators listed in the Directory of University Faculty in Agricultural Education provided by the American Association of Agricultural Educators (AAAE) on February 14, 2002. The population selected included practicing agricultural teacher educators as defined by Cano (2002) and Castillo (1999).

Castillo (1999) in a national study of agricultural teacher educators asked the department chairs at their respective university to identify those who were agricultural teacher educators. The Castillo (1999) list of teacher educators was purged by Cano.
(2002) to delete those teacher educators who were no longer employed by a university. In addition, those newly hired agricultural teacher educators were added to the list by Cano (2002).

The final list of agricultural teacher educators was further verified by comparing the generated list of agricultural teacher educators with the AAAE directory. The list of practicing agricultural teacher educators included 98 individuals (n=98). A census was used for the study.

**Methodology**

**Research Design**

The current study investigated the factors which influenced agricultural teacher educators participation in web-based distance education for delivering instruction in agricultural programs. In addition, the study sought to discuss agricultural teacher educators’ perceptions of their level of competence, level of importance, availability of infrastructure, training, and perceived major barriers faced in using web-based distance education technologies for delivering instruction in agriculture programs. The research design used in the study was classified as exploratory descriptive and correlational.

One of the objectives of this study was to determine the relationships among selected variables and agricultural teacher educators’ participation in web-based distance education. Therefore, in determining the strength of relationships, descriptors as recommended by Davis (1971), were used. According to Davis (1971) conventions for describing measures of association were the following: .70 or higher very strong association; .50 to .69 substantial association; .30 to .49 moderate association; .10 to .29 low association, and, .01 to .09 negligible association.
Two rules were set a priori. First, in order for the variable to have been considered for further analysis in the multiple regression procedure, the variable must have had a correlation value of .10 or greater. Second, the variable must have had a significant relationship with faculty participation in web-based distance education. In addition, all hypotheses were tested at alpha .05.

Instrumentation

The instrument used to collect data was a three-part questionnaire designed by Murphy and Dooley (2001) and modify by the researcher for this study (Appendix A). The instrument was four pages long and designed to be automatically scanned into a digital file by an optical character recognition (OCR) scanner. Part I of the questionnaire was designed to identify the selected personal and professional characteristics of the respondents and described their current level of involvement in the use of web-based distance education technology-mediated instruction.

Seven questions were devoted to demographic and professional variables. The seven questions were gender, age, the number of courses the faculty member taught per year, the number of years the faculty member had been teaching, region (western, eastern, central, and southern), the tenure status of the faculty member (non-tenure track, non-tenure, and tenured), and their academic rank or title (assistant professor, associate professor, and professor). An additional 12 questions were used to describe the respondents’ current level of participation in web-based distance education technology. The 12 questions were how many of the agricultural teacher educators had a website, how used, where the course website resided, software used, computer operating system
used, who created or maintained the web page, training on videoconferencing and web-based, where the training was received, frequencies teaching at distance, and participation in web-based.

Part II consisted of 32 statements designed to measure the level of competence of agricultural teacher educators have in the use of web-based technologies associated with distance education, perceived value or level of importance the technologies have or will have to the teaching of agriculture, and perceived availability of infrastructure related to the use of these technologies. The availability of infrastructure has four additional yes/no question about the e-mail and WWW at home an office and awareness about videoconferencing. Part III consisted of 13 statements designed to measure the perceived barriers which would inhibit agricultural teacher educators decision to participate in web-based distance education.

Content and face validity were established by a panel of experts (Appendix B and Appendix C). The revised instrument was pilot-tested with 18 faculty members from the Department of Human and Community Resource Development (Agricultural Communication) and the Department of Agricultural, Environmental and Development Economics at The Ohio State University (Appendix D). Internal consistency was evaluated with a Cronbach’s Alpha on each scale using the Statistical Package for Social Sciences (SPSS v.10). Reliability scores ranged from .80 to .89.

Data Collection and Analysis

The data collection process was conducted by mailing the instrument to the agricultural teacher educators during Spring Quarter 2002. The researcher had two months to collected the data.
The data collected was analyzed using SPSS v.10. Descriptive statistics were used to organize, describe, summarize, and simplify the data set using measures of central tendency such as means, medians, and modes (Warmbrod, 1993). In addition, Pearson-Product moment correlation coefficients ($r$), Point Biserial correlation coefficients ($r_{pb}$), and Spearman correlation coefficient ($r_s$), and multiple R coefficients ($R$) from the regression analysis were used to summarize the magnitude and direction of the relationships between variables. Descriptors identified by Davis (1971) were used to describe the measures of association. The squared semi-partial multiple regression correlation coefficient ($sR^2$) was calculated for each independent variable. This process was done in order to determine the proportion of the dependent variable that could be explained by each independent variable when the linear effects of the other independent variables have been removed from the independent variable being considered. The simultaneous model multiple regression was used to determine the significant independent variables that could best predict faculty participation in web-based distance education.

**Summary of Findings**

The summary is organized around the research objectives of the study. The specific data and information follow the statement of the research objective.

**Research Objective 1:** Describe the selected personal and professional characteristics (age, gender, tenure status, and years of teaching experience, teaching load, academic rank, and region) of agricultural teacher educators (faculty).
A total of 85 agricultural teacher educators respondents were the data source. The majority (77%) of the agricultural teacher educators were between the ages of 41 to 65 years. Ninety two percent (92%) were male while 8 percent were female. Moreover, the majority (82%) of the agricultural teacher educators was tenured faculty and had more than 16 years of teaching experience (76.2%). In addition, agricultural teacher educators taught a number of 1 to 7 courses per year (75%), and the majority (57%) has the academic rank of Professor. Most (39%) of the agricultural teacher educators were from the Southern region, 28% were from the Central region, 22% were from the Western regions, and 11% were from the Eastern region.

Research Objective 2: Describe how many of the faculty had a website, how used, where the course website resided, software used, computer operating system used, and who created or maintained the website.

Sixty-one percent (61%) of the agricultural teacher educators had a website, the course website resides in the university server (24%) and is used as a course enhancement (34%). Twenty percent of the software used for website creation and management were a combination of HTML editor (e.g. FrontPage, Dream Weaver), Word processor/presentation packages, and course management (e.g. WebCT and Blackboard).

The most common computer operating system used by agricultural teacher educators was WinNT/Win200 (44%), while 2% indicated a combination between, WinNT/Win2000 and Mac/OS. Furthermore, 33% of agricultural teacher educators pointed out that they were responsible for creating their own website, while 2% reported a combination between self and graduate/undergraduate student.
Research Objective 3: Describe training related to the use of web-based and videoconferencing technology to deliver distance education, where training on web-based and videoconferencing technologies were received, how many courses have been taught using web-based distance education by the agricultural teacher educators, and level of participation using web-based distance education technologies.

The majority (52%) of the agricultural teacher educators received training on the use of web-based technologies to deliver distance education, while 48% reported never received training on the use of web-based technologies for delivering distance education. In the other hand, 61% agricultural teacher educator reported no training in videoconferencing technologies, while 39% reported received training. Moreover, 33% of the agricultural teacher educators received training on the use of web-based technologies by the Department of University Technology, and 27% were self-taught. Furthermore, 28% of the training on how to use videoconferencing technologies for delivering distance education were provided by the Department of University Technology, and 26% were self-taught.

Moreover, 21% of the agricultural teacher educators indicated they taught 2 to 4 times a course during a semester or quarter using web-based technologies (either totally or enhanced) for distance education, 20% indicated 5-10 times, 19% taught more than 10 times, and 26% never taught courses using web-based technologies. Furthermore, 74% of the agricultural teacher educators were currently participating or previously taught a course using web-based distance education, while 26% reported not participating.
**Research Objective 4**: Describe what was the perceived level of competence that agricultural teacher educators have in the use of web-based technologies.

Twelve items on the questionnaire were used to measure the perceived level of competence that agricultural teacher educators possessed in the use of web-based technologies often associated with distance education. As an indication of competence, the agricultural teacher educators indicated that they were able to use many of the web-based teaching technologies. A notable exception was that 44% agricultural teacher educators indicated that they were uncomfortable creating their own WWW homepage. These results are consistent with studies done by Limin (1997), Roopnarine-Maedke (1989), and Ritchie and Hoffman (1997).

On the other hand, agricultural teacher educators were much more confident in their ability to create, edit, incorporate and use digital images as well as creating their own presentation graphics. These results are consistent with studies done by Dooley and Murphy (2001), Murphy and Dooley (2001), and Lynch and Corry (1998). Furthermore, a clear majority (92%) of the agricultural teacher educators used e-mail for almost all of their correspondence, while 53% would not sent their most important or confidential documents through e-mail. These results are consistent with studies done by Murphy and Terry (1995), Dooley and Murphy (2001), Murphy and Dooley (2001), Lynch and Corry (1998), Green (1996), Day, Raven and Newmart (1996), Goldberg (1997), Liao (1998), and Nooriafshar (1998).

In addition, more than a half (78%) of the agricultural teacher educators declared they were familiar with the teaching methods appropriate for distance learning. These results are consistent with studies done by Schmidt and Faulkner (1989). A majority

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(59%) of the agricultural teacher educators could confidently deliver a course over the web and 53% delivered a course using a course management system. These results are consistent with studies done by Murphy and Dooley (2001). Finally, the majority (86%) of the agricultural teacher educators concurred that they were able to connect a computer to the various output devices available (LCD projector, TV, etc.).

**Research Objective 5:** Describe agricultural teacher educators perceptions of the level of importance of web-based technologies have or will have in teaching and learning.

Twelve items were used to measure value—that is—the importance of the role agricultural teacher educators believed web-based technologies have or will have to teaching agriculture. An overwhelming majority (97.7%) of the agricultural teacher educators concurred that the Internet/WWW were convenient ways to access information. In addition, 78% of the agricultural teacher educators declared that participation in listservs, threaded discussion groups, chats and other electronic communications offered great benefits. Seventy-seven percent of the agricultural teacher educators stated that most course materials would be improved by incorporating multimedia. These results are consistent with studies done by Harris (1992), Schumacher and Strickland (1992), Liao (1998), and Green (1996).

Moreover, (78%) agricultural teacher educators affirmed that animated graphics increased student interest and (39%) retention. These results are consistent with studies done by Murphy and Dooley (2001), and Nordheim and Connors (1997). The majority (81%) of the agricultural teacher educators concurred that, students today prefer a more visual learning experience and more than three-quarters of agricultural teacher educators
responded (94%) that web-based technologies provide students with instantly available supplemental course and research materials. These results are consistent with studies done by Murphy and Dooley (2001).

Furthermore, 77% of the agricultural teacher educators have the same opinion that it was important to incorporate web-based technologies in the courses they teach. On the contrary, 61.2% were opposed to the statement that learning requires a face-to-face interaction. In addition, 82.4% of the agricultural teacher educators are not opposed to distance education. These results are consistent with studies done by Dooley and Murphy (2001), Murphy and Dooley (2001), Willis, Willis, Austin and Colon (1995), Day, Raven and Newmart (1996), Goldberg (1997), Liao (1998), and Nooriafshar (1998).

This study found that agricultural teacher educators considered the use of web-based technologies to enhance their teaching to be useful and important. However, agricultural teacher educators' opinions were mixed concerning the effect of web-based technologies. Although agricultural teacher educators clearly agree (37%) or strongly agree (32%) with the statement, “Web-based technologies and information will drastically alter how we teach in the next five years”, 45% did not support the statement, “Web-based technologies and information drastically alter what we teach in the next five years.” In general, agricultural teacher educators perceived that web-based technologies would continue to have a substantial impact on teaching, changing how teaching is conducted. However, a growing number of faculty members did not believe that web-based technologies would also change what we teach.
Research Objective 6: Determine the perceived availability of infrastructure for agricultural teacher educators to use web-based technologies.

Eight items were used to measure the perceived availability of infrastructure to determine the extent to which the campus environment supported the use of web-based technologically mediated instruction on- and off-campus. In addition, four yes/no type questions were used to measure: (a) accessibility of the web from home and office; and, (b) awareness of the office and personnel in charge of scheduling videoconferencing.

Concerning the availability of infrastructure, agricultural teacher educators (100%) indicated they were connected to electronic mail in their office, and 88% indicated they were connected at home. In addition, 78% of the agricultural teacher educators were aware of the office on campus for scheduling videoconferencing, and 77% were aware of the personnel responsible for scheduling videoconferencing. Furthermore, 81.2% of the agricultural teacher educators concurred that the equipment needed to produce multimedia course materials and (86%) the equipment needed to display multimedia was available to be used. In addition, 86% of the agricultural teacher educators pointed out that they have access to a classroom that was designed to support the use of multimedia teaching aids.

Additionally, 72% of the agricultural teacher educators declared that there was many opportunities for faculty training on using multimedia equipment and 53% on videoconferencing. Moreover, 48% stated that there was enough faculty development workshops regarding videoconferencing and 68% of the agricultural teacher educators agreed they were aware of the procedures on campus, for scheduling videoconferencing. Furthermore, 68% of the agricultural teacher educators affirmed that they have access to
technical assistance when teaching at a distance. These results are consistent with studies done by Willis (1993). In general, training and technical assistance in the use of web-based technologies and equipment is available for agricultural teacher educators. However, in Murphy and Terry (1995), Dooley and Murphy (2001), and Murphy and Dooley (2001), the training and assistance in the use of instructional technologies were less available than equipment.

Research Objective 7: Describe what the agricultural teacher educators perceived as major barriers for participating in the use of web-based technologies for delivering distance instruction in agricultural settings.

Thirteen items were used to measure the perceived major barriers that agricultural teacher educators would consider that inhibit their decision to participate in web-based technologies (either totally or enhanced) for delivering distance education.

Agricultural teacher educators identified six major barriers that would inhibit their decision to participate in using web-based technologies to deliver distance education. Those barriers were: (1) the lack of administratively provided time, like professional development leave, to learn to use web-based technologies (56%); (2) the lack of a reward and incentives that encourages faculty to participate in web-based distance education (59%); (3) the lack of credit toward tenure and promotion (50%); (4) concern about workload (67%); (5) the lack of grants materials/expenses (funding) (51%); and, (6) concern about the effects of distance education technology on the quality of the courses (53%). These results are consistent with studies done by Shifflet (1993), Fabry and Higgs (1997), Jackson (1993), Pajo and Wallace (2001), Dillon (1989) Murphy and

The identified barriers that would not inhibit agriculture educators' decision to participate in using web-based technologies to deliver distance education were: (1) the lack of administratively provided time, (i.e. not leave) during the day to attend workshops (49%); (2) the lack of a technological background (50%); (3) the lack of facilities designed to utilize web-based technologies (48%); (4) the lack of Institutional support (45%); (5) the lack of faculty training (45%); (6) the lack of technical support personnel provided by the institution (50%); and, (7) resistance to change (77%).

Research Objective 8a: Describe what relationship existed between the perceived level of competence and selected personal and professional characteristics (age, gender, rank, tenure status, year of teaching experience and prior experience in teaching courses using distance education, and training).

A significant low negative relationship ($r = -.23$) was found between the agricultural teacher educators' age and their level of competence. Moreover, a negligible association ($r = -.04$) was found between the agricultural teacher educators' gender and level of competence, and a significant low negative association ($r = -.26$) was found between the agricultural teacher educators' rank and level of competence. In addition, no significant relationship ($r = -.20$) was found between the agricultural teacher educators' tenure status and level of competence. Moreover, no significant relationship ($r = -.12$) was found between agricultural teacher educator's year of teaching experience and level of competence, and a significant moderate positive association ($r = .34$) was found
between level of competence and prior experience in teaching courses using distance education. Finally, no significant relationship \((r = .13)\) was found between level of competence and training on web-based technologies.

**Research Objective 8b:** Describe what relationship existed between the perceived level of importance and selected personal and professional characteristics (age, gender, rank, tenure status, year of teaching experience and prior experience in teaching courses using distance education, and training).

No significant relationship was found between the agricultural teacher educators' age \((r = .21)\), gender \((r = -.10)\), and level of importance. In addition, a significant relationship \((r = .26)\) was found between agricultural teacher educators' years of teaching experience and level of importance. Moreover, a negligible association was found between the agricultural teacher educators' rank \((r = -.01)\), tenure status \((r = .03)\), and prior experience in teaching courses using distance education \((r = -.03)\), training on web-based technologies \((r = .05)\), and level of importance.

**Research Objective 8c:** Describe what relationship existed between the perceived availability of infrastructure, and level of competence.

A significant relationship \((r = .30)\) was found between agricultural teacher educators' perception on the availability of infrastructure and level of competence.
Research Objective 8d: Describe what relationship existed between the perceived availability of infrastructure, and level of importance.

A significant relationship \( r = .30 \) was found between agricultural teacher educators’ perception on the availability of infrastructure and level of importance.

Research Objective 8e: Describe what relationship existed between the identified major barriers and the level of importance.

No significant relationship \( r = -.16 \) was found between “the lack of professional development leave”, and level of importance. Moreover, a significant relationship \( r = -.26 \) was found between “the lack of reward and incentives”, “the lack of credit toward promotion” \( r = -.23 \), and level of importance. Additionally, a negligible association was found between “concerns about workload” \( r = -.08 \), “the lack of grants material/expenses (funding)” \( r = -.02 \), “concern about the effect of distance education technology on the quality of courses” \( r = -.01 \), and level of importance.

Research Objective 8f: Describe what relationship existed between the identified major barriers and the level of competence.

A significant relationship was found between “concern about workload” \( r = -.23 \), and level of competence. Moreover, no significant relationship was found between “lack of professional development leave” \( r = -.18 \), “lack of reward and incentives” \( r = -.16 \), “lack of credit toward promotion” \( r = -.15 \), “lack of grants material/expenses (funding)” \( r = -.12 \), and level of competence. In addition, a negligible association \( r = -.07 \) was found between “concern about the effect of distance education technology on the quality of courses” \( r = -.07 \), and level of competence.
Research Objective 9: Explain the variance in the dependent variable, faculty participation in web-based distance education, through a linear combination of the independent variables.

For this investigation, a simultaneous multiple regression procedure was used to develop regression equations for predicting faculty participation in web-based distance education. The independent variables that were significantly related to faculty participation in web-based distance education were included in the analysis. The best predictors of faculty participation in web-based distance education were found to be level of competence/skills and lack of grant material/expenses (funding). Although the variable of infrastructure had significant correlations with faculty participation in web-based distance education, when the variable was entered to the equation, the variable of infrastructure did not significantly contribute to the prediction of faculty participation in web-based distance education. The two independent variables that were included in the calculation of the semi-partial multiple regression coefficient accounted for 33% of the faculty participation in web-based distance education.

The independent variable, level of competence/skills, uniquely accounted for 27.1% of the variance in faculty participation in web-based distance education when the effect of the other independent variables were removed. The t-test value was 5.79 and it was significant at $p < .05$.

The independent variable, lack of grants materials/expenses (funding), uniquely accounted for 3.4% of the variance in faculty participation in web-based distance education, when the effect of the other independent variables were removed. The t-test value was -2.05 and it was significant at $p < .05$. 

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Conclusions

Based upon the findings of this study, the following conclusions can be drawn:

1. Agricultural teacher educators are confident in their competence in the use of web-based technologies. Furthermore, agricultural teacher educators would, in general, agree that they were competent in the use of web-based technologies. Similar conclusions were drawn by Murphy and Dooley (2001), and Dooley and Murphy (2001).

2. The agricultural teacher educators agreed that web-based technologies could make a valuable contribution to the learning process. In addition, agricultural teacher educators believe that technology should be used in all classes, and web-based technology will change how we teach in the next five years, but not what we teach.

3. In general, training and technical assistance in the use of web-based technologies and equipment was available for agricultural teacher educators. However, in Murphy and Terry (1995), Dooley and Murphy (2001), and Murphy and Dooley (2001), the training and assistance in the use of instructional technologies were less available than equipment.

4. Agricultural teacher educators identified six major barriers that would inhibit their decision to participate in using web-based technologies to deliver distance education. Those barriers were: (1) the lack of administratively provided time, like professional development leave, to learn to use web-based technologies; (2) the lack of a reward and incentives that encourages faculty to participate in web-based distance education; (3) the lack of credit toward tenure and promotion; (4) concern about workload; (5) the lack of grants materials/expenses (funding); and, (6) concern about the effects of

5. The average agricultural teacher educators was a male from the Southern region, between 41-65 years of age, with more than 16 years of teaching experience, tenured at the rank of professor, and who had taught between of 1 to 7 courses per year at distance. This population is similar than those described in Dillon and Walsh's (1992) metaanalysis of distance education research that focused on faculty members who had previously taught one or more distance courses. In addition, this population is similar than those described in Murphy and Dooley (2001), Dooley and Murphy (2001) and Murphy and Terry (1995).

6. The agricultural teacher educators had a website and the course website reside in the university server and was used as a course enhancement. The software used for website creation and management were a combination of HTML editor (e.g. FrontPage, Dream Weaver), Word processor/presentation packages, and course management (e.g. WebCt and Blackboard). The most common computer operating system used by agricultural teacher educators was WinNT/Win2000 and a combination between, WinNT/Win2000 and Mac/OS. Furthermore, agricultural teacher educators pointed out that they were responsible for creating their own
website, also reported a combination between self and graduate/undergraduate student. Similar conclusions were drawn by Murphy and Dooley (2001), and Dooley and Murphy (2001).

7. The agricultural teacher educators received training on the use of web-based technologies to deliver distance education, but no training on the use of videoconferencing technologies for delivering distance education. The Department of University Technology offered training on the use of web-based technologies. Moreover, the agricultural teacher educators taught 2 to 4 times a course during a semester or quarter using web-based technologies (either totally or enhanced) for distance education. Therefore, agricultural teacher educators were currently participating on web-based distance education. Similar conclusions were drawn by Murphy and Dooley (2001), and Dooley and Murphy (2001).

8. A significant relationship existed between age, rank, concern about workload, availability of infrastructure, and level of competence. In addition, a significant relationship existed between years of teaching, lack of reward and incentives, credit toward tenure and promotion, and availability of infrastructure and level of importance.

9. The final regression model yielded two predictor variables: Level of competences/skills and lack of grant material/expenses (funding). Although the variable of infrastructure had significant correlations with faculty participation in web-based distance education, when the variable was entered to the equation, the variable of infrastructure did not significantly contribute to the prediction of faculty participation in web-based distance education. The two independent variables that
were included in multiple regression model accounted for 33% of the faculty participation in web-based distance education. Before the current study, no study had been conducted using multiple regression analysis as a statistical tool to investigate factors which influenced faculty participation in web-based distance education for delivering instruction in agricultural programs. The variables included in the regression exploratory model need to be studied in depth details in further studies.

Revised Model

Figure 13 shows the factors included in the exploratory regression model. The factors included in the model were those found to be significantly correlated with faculty participation in web-based distance education. The asterisks in the model indicated those variables found with significant correlations with faculty participation.

Level of importance, training, and selected barriers such as: concerns about the quality of the course; concern about workload; the lack of credit toward tenure and promotion; and, the lack of reward and incentives, were not correlated with faculty participation in web-based distance education and, therefore, were not included in the model. Although the barrier, “the lack of administratively provided time, like professional developmental leave, to learn web-based technologies,” was correlated with faculty participation in web-based distance education, the correlation was not significant, and therefore was not included in the model. Finally, the factors included in the model were: level of competence, and the lack of grant materials/expenses (funding).
Figure 13: Revised Model of the Factors Related to Faculty Participation in Web-Based Distance Education Technologies

Note. * Significant at p < .05
Recommendations

It is recommended that:

1. The value of web-based technologies for learning and the successful integration of technology into the student’s course depends not only on access and on availability, but also on how faculty embrace and use technology. It is important to understand that faculty play an important role in the implementation of distance education and technological change. However, as indicated in this study, faculty participation in web-based distance education is influenced by level of competence/skills and the availability of funding. In order to increased faculty involvement in web-based distance education, several recommendation are offered: (1) provide faculty with an overview of web-distance education and information on how to become involved in agricultural distance education programs; (2) deans and department chairs need to address and eliminate the inhibiting factors that deter faculty from participating in distance education and stress the benefits associated with web-based distance education.

2. Establish a distance education central office for agricultural programs to serve as a clearinghouse for information and projects regarding web-based distance education.

3. It is important to provide faculty with faculty development programs focused on web-based distance education technology needs and access to technical assistant when teaching at distance. In addition, the researcher agreed with Willis (1993) when it was recommended that it was necessary to provide faculty with answers to technical,
administrative, and academic questions in a language which was understood by faculty. It is imperative that institutions establish a comprehensive faculty development program, including incentives.

4. As Parisot (1997) stated, “Institutions need to address the barriers that impede the adoption and use of distance technologies by faculty and build policy that encourages openness to new teaching methods, as well as changes in a college's organizational and administrative structure” (p. 12). It is recommended by the researcher that the administrative policy for tenure and promotion be revised. In addition, develop a new program of incentives and reward for faculty that are currently participating in distance education as well to stimulate the non-participant.

5. Even though the agricultural teacher educators in this study reported having received training in web-based technologies, it is recommended that training should be strategically planned and integrated within an entire institution. Training is an area where the administration can offer significant support for the faculty and the distance learning programs at their institution (Siantz & Pugh, 1994).

6. Institutions need to provide adequate support, ensuring reasonable workloads, and making it easier for staff to make the transition to the new technologies would assist in facilitating the rapid diffusion of web-based teaching initiatives.

For Further Research

1. Because of the exploratory nature of the multiple regression model, an investigation of the factors which would account for additional variance in faculty participation in web-based distance education needs to be undertaken.
2. Since 67% of the variance in faculty participation in web-based distance education remains unexplained, research should be conducted using level of involvement as a potential independent variable as well other selected variables, such as prior experience teaching distance education courses, teaching load, attitudes toward the use of technology for teaching, and teaching styles.

3. A follow-up study should be designed to focus on the participation of agricultural teacher educators 45 year of age and older in distance education. The study can focus on how these faculty members get involved in web-distance education, whether or not they are tenured, how often they published, and identify possible barriers to continuing participation in web-based distance education.

4. It is recommended that a study be conducted including administrators such as agricultural college deans and department chairs to determine the level of support that faculty receive from an institutional point of view and determine if that support is positive or negative in regards to motivating faculty participation in web-based distance education.

5. Finally, it is recommended for further study to replicate this study with a larger sample size of agricultural teacher educators and use principal components analysis as a statistical data reduction procedure which identifies how variables cluster. Then, the identified principal components can be used in the regression model to explain and predict variance in the faculty participation in web-based distance education. The
advantage to using this technique is that the computed principal component score could reduce the number of independent variables (predictors) in the multiple regression model (Stevens, 1992).
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APPENDIX A

INSTRUMENT / QUESTIONNAIRE
## Distance Education Technology Survey

The American Association of Agricultural Education

<table>
<thead>
<tr>
<th>Gender</th>
<th>Male</th>
<th>Female</th>
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<tbody>
<tr>
<td>Age</td>
<td>&lt; 30</td>
<td>30-40</td>
</tr>
<tr>
<td>Years of Teaching Experience</td>
<td>&lt; 2</td>
<td>2-6</td>
</tr>
<tr>
<td>Tenure</td>
<td>Non-Tenured</td>
<td>Tenured</td>
</tr>
</tbody>
</table>

### Teaching Load (number of courses taught per year)
- 1
- 2
- 3
- 4
- 5
- Other, please specify

### Academic Rank / Title
- Assistant Professor
- Associate Professor
- Professor

### Region
- Western
- Eastern
- Central
- Southern

1. Do you have a course website?
   - Yes
   - No (if no, proceed directly to Question #8)

2. If yes, how is it used?
   - Course enhancement
   - Required component of the course
   - Course is completely delivered on the web

3. Where does the course website reside?
   - Departmental Server
   - Central University Server
   - College Server
   - Other
   - Don’t know

4. Select any of the following software you have used, or plan to use, for website creation and management.
   - HTML Editor (e.g., Front Page, Dream Weaver)
   - Word Processor/Presentation
   - Course Management (e.g., WebCT, Blackboard)
   - Other

5. Who creates or maintains your course webpage(s) and instructional graphics?
   - Self
   - Graduate/Undergraduate student
   - Support staff
   - Other

6. Which computer operating system do you use?
   - Win95 or earlier
   - Win98/WinMe
   - WinNT/Win2000
   - WinXP
   - MacOS

7. Did you receive any training on the use of web-based technologies for delivering Distance Education?
   - Yes
   - No

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8 Where have you received training on web-based technologies?
   ☐ Nowhere ☐ Self taught ☐ University Technology Dept. ☐ Other, please specify
   or similar

9 Did you receive any training on the use of videoconferencing technologies for delivering Distance
   Education?
   ☐ Yes ☐ No

10 Where have you received training on videoconferencing technologies?
    ☐ Nowhere ☐ Self taught ☐ University Technology Dept. ☐ Other, please specify
    or similar

11 How many times have you taught courses using web technologies as a component (either totally or
   enhanced) for distance education (e.g. AGED 489, three semesters or quarters = 3)?
   ☐ 1 ☐ 2-4 ☐ 5-10 ☐ >10 ☐ None

Instructions:
For each item, indicate the response that best described the extent to which you agree or disagree on the following statements.

12 I am comfortable creating my own WWW homepage.

13 I am comfortable creating my own presentation graphics (e.g. PowerPoint, Corel Presentations, etc.).

14 I use e-mail for almost all my correspondence.

15 I send my most important and confidential documents through e-mail.

16 I am able to scan images into digital files.

17 I am able to manipulate digital images using software (e.g. Photoshop).

18 I am able to record digital sound in my presentations.

19 I am able to incorporate digital sound in my presentations.

20 I am familiar with the teaching methods appropriate for distance learning.

21 I could confidently deliver a course over the web.

22 I could confidently deliver a course using a course management system (e.g. WebCT, Blackboard).

23 I am comfortable connecting a computer to the various output devices available (e.g. LCD projector and TV).
<p>| | | | | |</p>
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<tbody>
<tr>
<td><strong>24</strong></td>
<td>The Internet/WWW are convenient ways to access information.</td>
<td></td>
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<tr>
<td><strong>25</strong></td>
<td>Participation in listserv, threaded discussions groups, chats</td>
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<tr>
<td><strong>26</strong></td>
<td>and other electronic communications offers great benefits.</td>
<td></td>
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<tr>
<td><strong>27</strong></td>
<td>Web-based technologies and information will drastically alter HOW we teach in the next five years.</td>
<td></td>
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<tr>
<td><strong>28</strong></td>
<td>Web-based technologies and information will drastically alter WHAT we teach in the next five years.</td>
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<td></td>
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<tr>
<td><strong>29</strong></td>
<td>I think most course materials would be improved by incorporating multimedia (e.g. Audio files, Video files).</td>
<td></td>
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<tr>
<td><strong>30</strong></td>
<td>Animated graphics increase student interest.</td>
<td></td>
<td></td>
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<tr>
<td><strong>31</strong></td>
<td>Animated graphics increase student retention.</td>
<td></td>
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<tr>
<td><strong>32</strong></td>
<td>Students today prefer a more visual learning experience.</td>
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<tr>
<td><strong>33</strong></td>
<td>Web-based technologies provide students with instantly available supplemental course and research materials.</td>
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<tr>
<td><strong>34</strong></td>
<td>It is important that I incorporate web-based technologies in the course(s) I teach.</td>
<td></td>
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<tr>
<td><strong>35</strong></td>
<td>Learning requires a face to face interaction between teachers and the students.</td>
<td></td>
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<tr>
<td><strong>36</strong></td>
<td>The equipment needed to produce web multimedia course materials is readily available to me (e.g. Computers, Software).</td>
<td></td>
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</tr>
<tr>
<td><strong>37</strong></td>
<td>The equipment needed to display web multimedia course materials is readily available to me (e.g. LCD projectors, Computers).</td>
<td></td>
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<tr>
<td><strong>38</strong></td>
<td>I have access to a classroom that is designed to support the use of multimedia teaching aids.</td>
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<tr>
<td><strong>39</strong></td>
<td>There are ample opportunities for faculty training on using multimedia equipment (e.g. LCD projectors, Computers).</td>
<td></td>
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</tr>
<tr>
<td><strong>40</strong></td>
<td>There are ample opportunities for faculty training on using videoconferencing equipment.</td>
<td></td>
<td></td>
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<tr>
<td><strong>41</strong></td>
<td>There are adequate faculty development workshops regarding videoconferencing.</td>
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<tr>
<td><strong>42</strong></td>
<td>I have access to technical assistance when teaching at a distance.</td>
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<tr>
<td><strong>43</strong></td>
<td>I am aware of the procedures on campus for scheduling videoconferencing.</td>
<td></td>
<td></td>
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<tr>
<td><strong>44</strong></td>
<td>I am opposed to distance education based on my philosophy of teaching.</td>
<td></td>
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</tr>
</tbody>
</table>
Instructions:
Identify the extent to which you agree that the factors listed below would inhibit your decision to participate in web-based technologies (either totally or enhanced) for deliver distance education.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>44</td>
<td>The lack of administratively provided time, like professional development leave, to learn to use web-based technologies.</td>
<td></td>
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<tr>
<td>45</td>
<td>The lack of a reward and incentives that encourages faculty to participate in web-based distance education.</td>
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<tr>
<td>46</td>
<td>The lack of administratively provided time, (i.e. not leave) during the day to attend workshops.</td>
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<td>47</td>
<td>The lack of a technological background.</td>
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<tr>
<td>48</td>
<td>The lack of facilities designed to utilize web-based technologies.</td>
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<tr>
<td>49</td>
<td>The lack of institutional support.</td>
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<tr>
<td>50</td>
<td>The lack of faculty training.</td>
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<tr>
<td>51</td>
<td>The lack of credit toward tenure and promotion.</td>
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<tr>
<td>52</td>
<td>The lack of technical support personnel provided by the institution.</td>
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<tr>
<td>53</td>
<td>Concern about my workload.</td>
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<tr>
<td>54</td>
<td>Resistance to change.</td>
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<td></td>
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<tr>
<td>55</td>
<td>Lack of grants/materials/expenses (funding).</td>
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<tr>
<td>56</td>
<td>Concern about the effects of distance education technology on the quality of the courses I teach.</td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

57 Are you a faculty member who is currently participating or previously taught using web-based distance education?
- Yes
- No

58 Are you connected to e-mail and the WWW at your office?
- Yes
- No

59 Are you connected to e-mail and the WWW at home?
- Yes
- No

60 Are you aware of the office on campus for scheduling videoconferencing?
- Yes
- No

61 Are you aware of the personnel responsible for scheduling videoconferencing?
- Yes
- No
APPENDIX B

LETTER TO THE PANEL OF EXPERT
Date: March 4, 2002

Panel of Expert Member Name
208 Agricultural Administration Building
2120 Fyffe Road
Columbus, OH 43210

Dear Mr./Ms. Panel of Expert Member:

You have been selected to participate on the panel of experts review of the survey instrument. You have been chosen because of your recognized background, education, experience, or other combination of attributes makes your input a valuable contribution to ensuring that this survey instrument is valid. The questionnaire was developed as part of a study for the American Association of Agricultural Educators (AAAAE)

Please review the attached copy of the questionnaire for face and content validity. In your assessment, is the survey instrument appropriately aligned with the stated research objectives and does it "look" and "feel" like it will measure what it claims to measure. Format of the instrument was guided by the recommendations of Dillman (2000) in Mail and Internet Surveys. The Tailored Design Process. To assist you in your review, the following research objectives were used to guide the development of the survey questions. Please keep in mind that these objectives are not ranked in order of their importance nor do they necessarily appear in the same order in the survey instrument.

1. Describe the selected personal and professional characteristics of Agricultural Teacher Educators.
2. Describe the faculty level of involvement in using Web-based technologies.
3. Describe the perceived level of competence that Agricultural Teacher Educators have in the use of Web-based technologies.
4. Describe Agricultural Teacher Educators perceptions of the level of importance of Web-based technologies have or will have in teaching and learning.
5. Determine the perceived availability of infrastructure, for Agricultural Teacher Educators to use Web-based technologies.
6. Describe what Agricultural Teacher Educators perceived as major barriers for participating in the use of Web-based technologies for delivering distance instruction in agricultural settings.

Please make any suggestions or comments which you feel will improve the face and content directly on the instrument. Your expertise is greatly appreciated and will help to ensure that the eventual administration of this questionnaire will yield dependable and usable results. A pilot test to establish the reliability of the instrument is scheduled in the near future.

Sincerely,

[[Signature]]

Auroy Curado
Ph.D Candidate
APPENDIX C

LIST OF PANEL OF EXPERTS
<table>
<thead>
<tr>
<th>Panel member</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mr. Robert Straveler, Ph.D., MSW</td>
<td>The Ohio State University</td>
</tr>
<tr>
<td></td>
<td>College of Social Work</td>
</tr>
<tr>
<td>Mr. Richard Voithofer, Ph.D.</td>
<td>Assistant Professor</td>
</tr>
<tr>
<td></td>
<td>School of Educational Policy and Leadership</td>
</tr>
<tr>
<td></td>
<td>The Ohio State University</td>
</tr>
<tr>
<td>Mr. Brian Stanford</td>
<td>Graduate Research Associate</td>
</tr>
<tr>
<td></td>
<td>Department of Human Community</td>
</tr>
<tr>
<td></td>
<td>Resources Development</td>
</tr>
<tr>
<td></td>
<td>The Ohio State University</td>
</tr>
<tr>
<td>Ms. Evan T. Straub</td>
<td>Instructional Development Specialist</td>
</tr>
<tr>
<td></td>
<td>Office of Information Technology</td>
</tr>
<tr>
<td></td>
<td>The Ohio State University</td>
</tr>
<tr>
<td>Mr. Warren Flood</td>
<td>Graduate Administrative Associate</td>
</tr>
<tr>
<td></td>
<td>Department of Human Community</td>
</tr>
<tr>
<td></td>
<td>Resources Development</td>
</tr>
<tr>
<td></td>
<td>The Ohio State University</td>
</tr>
</tbody>
</table>

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APPENDIX D

LETTER TO THE PILOT TEST MEMBERS
March 8, 2002

Pilot Test Member Name
208 Agricultural Administration Building
2120 Fyffe Road
Columbus, OH 43210

Dear Mr./Mrs./Ms. Pilot Test Member:

I am writing to ask your help in a study being conducted by the Department of Human and Community Resources Development. The study is meant to gather information concerning issues relevant to faculty members in the College of Food, Agricultural, and Environmental Sciences. The study is part of an effort to learn more about the factors which influence faculty participation in using Web-based technologies to delivering distance education in agriculture programs.

Results from the survey will help in generating a better understanding of the characteristics and factors which influence faculty to use Web-based technologies in delivering distance education programs. Other agricultural colleges in the nation and professionals in other fields will be able to use the findings of this study to improve the planning, management, and effectiveness use of Web-based technologies and support their faculty workforce.

Because of your interest and involvement in education and specifically issues surrounding faculty, you have been selected and asked to participate in a pilot test of the enclosed survey instrument. You have been chosen because of your recognized background, education, experience, or other combination of attributes makes your input a valuable contribution to ensuring that this questionnaire is a reliable survey instrument.

Your answers to this questionnaire are completely confidential. Once I have entered all the responses to the questionnaire into a personal computer for statistical analysis, the survey instruments will be destroyed so that individual names can never be connected to the results of the pilot test in any way. Concerning the survey procedures, I have printed a questionnaire identification number on the back cover of the questionnaire. This is so that I can check your name off the mailing list when it is returned, the number will never be used to track an individual's responses. Protecting your confidentiality is very important to me as well as the University and the Department of Human and Community Resources Development.

Of course, participation in this survey is strictly voluntary. However, you can help me very much by taking a few minutes to share your opinions about the factors that might influence faculty participation in using Web-based technologies to delivering distance education in agriculture programs in order to develop a coefficient of reliability for the summarized scales of the instrument. If for some reason you prefer not to respond, please let me know by returning the blank questionnaire in the enclosed campus mail envelope.

Sincerely,

Amy M. Curbelo-Ruiz
Ph.D. Candidate

Agricultural Communication • Agricultural Education • Extension Education • Rural Sociology • Vocational Education
March 11, 2002

Dr. «First_Name» «Last_Name»

A few days from now you will receive in the mail a request from Dr. Jamie Cano and me to fill out a brief questionnaire.

The questionnaire is part of an effort to learn more about the factors, which influence faculty participation in using web-based technologies to deliver distance education in agricultural education programs.

I am writing in advance because I have found many individuals like to know in advance that they will be receiving the questionnaire. An outcome of the study is to generate important and valuable information, which will help in gaining a better understanding of the characteristics and factors, which influence faculty to use web-based technologies in delivering distance education programs. Other agricultural colleges in the nation and professionals in other fields will be able to use the findings of this study to improve the planning, management, and effectiveness of web-based technologies and support their faculty workforce.

Thank you for your time and consideration. It is only with your help that the research can be successful.

Sincerely,

Aury Curbelo-Ruiz
Ph.D. Candidate

P.S. I will be enclosing a small token of appreciation with the questionnaire as a way of saying thanks.
APPENDIX F

COVER LETTER INITIAL MAILING
April 1, 2002

Dear Dr.:

I am conducting a study to determine factors which influence faculty participation in using web-based technologies to deliver distance education in agricultural programs.

You are one of the agricultural teacher educators chosen to participate in this national study. I would appreciate receiving your input so that the result will truly reflect the view of those who participate in agricultural education programs. Results from the survey will help in generating a better understanding of the characteristics and factors which influence faculty to use web-based technologies in delivering distance education programs. Other agricultural colleges in the nation and professionals in other fields will be able to use the findings of this study to better improve the planning, management, and effectiveness use of web-based technologies and support their faculty workforce.

Your answers to this questionnaire are completely confidential and will be released only as summaries in which no individual's answers could possibly be identified. When you return your completed questionnaire, your name will be deleted from the mailing list and never be connected to your answers once the data has been entered into a personal computer for statistical analysis. Survey instruments will be destroyed after the data has been entered.

Of course, participation in this survey is strictly voluntary. If for some reason, you prefer not to respond, please let me know by returning the blank questionnaire in the pre-addressed stamped envelope by Friday, March 28, 2002.

A number has been placed on the questionnaire to aid in facilitating follow-up contacts to those who have not responded. It is not placed on the questionnaire as a means to identify anyone's individual answers.

I have enclosed a small token of appreciation as a way of saying thanks for your help. If you have any questions or comments about this study, we would be happy to talk with you. You can call me at (614) 485-0905, e-mail me at curbelo-raiz.1@osu.edu, or you can write to me at the address on the letterhead.

Thank you very much for helping with this important study. Your contribution is greatly appreciated.

Sincerely,

[Signature]

Aury Curbelo
Ph.D. Candidate
APPENDIX G

THANK YOU/REMINDER POSTCARD
Dear Dr.:

Last week a questionnaire was mailed to you seeking your opinions about the factors that influence agricultural teacher educators to participate using Web-based technologies to deliver distance education in agriculture programs.

If you have already completed and returned the questionnaire, please accept my sincere thanks. If not, please do so today. I am very grateful for your help because it is only by asking people like you to share your experiences that we can understand the factors which influence agricultural teacher educators to participate using Web-based technologies to deliver distance education in agriculture programs.

If you did not receive a questionnaire, or if it was misplaced, please call me at 614-485-0968 or e-mail me at curbelo-ruiz.1@osu.edu and I will get another one in the mail to you today.

Aury Curbelo-Ruiz
Ph.D Candidate
2011 Harwitch Road
Columbus, Ohio 43221
APPENDIX H
DEFINITION POSTCARD
Web-Based Technologies (either totally or enhanced)

For the purpose of this study, web-based technologies are the means by which material is delivered to students, that is, "media". Classification of media includes: videoconferencing; portable video; computer-based (e-mails, listserver, and most World Wide web-based courses), digital imaging (digital cameras, scanners, digital video) and Internet-based technologies.
APPENDIX I

SECOND COVER LETTER
April 1, 2002

Name
Address
City, State Zip

Dear Dr.:

About three weeks ago, a questionnaire was mailed to you seeking your opinions about factors that influence agricultural teacher educators to participate using Web-based technologies to deliver distance education in agriculture programs.

I am writing again because of the importance that your questionnaire has for helping to get accurate results. It is only by hearing from everyone in the sample that we can be sure that the results are truly representative.

Your answers to this questionnaire are completely confidential and will be released only as summaries in which no individual's answers could possibly be identified. When you return your completed questionnaire, your name will be deleted from the mailing list and never be connected to your answers once the data has been entered into a personal computer for statistical analysis. Survey instruments will be destroyed after the data has been entered.

A number has been placed on the questionnaire to aid in facilitating follow-up contacts to those who have not responded. It is not placed on the questionnaire as a means to identify anyone's individual answers.

I hope that you will fill out and return the questionnaire soon, but if for any reason you prefer not to answer it, please let me know by returning a note or blank questionnaire in the enclosed stamped envelope by Friday, April 12, 2002.

If you have any questions or comments about this study, we would be happy to talk with you. You can call me at (614) 465-0968, e-mail me at curbelo-ruz.1@osu.edu, or you can write to me at the address on the letterhead.

Thank you very much for helping with this important study. Your contribution is greatly appreciated.

Sincerely,
Ally Curbelo
Ph.D. Candidate
April 6, 2002

Dear Dr.:

About three weeks ago, a questionnaire was mailed to you seeking your opinions about the factors that influence agricultural teacher educators to participate using Web-based technologies to deliver distance education in agriculture programs.

If you have already completed and returned the questionnaire, please accept my sincere thanks. If not, please do so today. I am very grateful for your help because it is only by asking people like you to share your experiences that we can understand the factors which influence agricultural teacher educators to participate using Web-based technologies to deliver distance education in agriculture programs.

If you did not receive a questionnaire, or if it was misplaced, please call me at 614-485-0968 or e-mail me at cuibelo-ruiz.1@osu.edu and I will get another one in the mail to you today.

Aury Curbelo-Ruiz
Ph.D Candidate
2011 Harwitch Road
Columbus, Ohio 43221
APPENDIX K

PICTURE OF THE "THANK YOU PEN"

225
APPENDIX L

SECOND THANK YOU/REMINDER POSTCARD
Dear Dr.:

About three weeks ago a questionnaire was mailed to you seeking your opinions about the factors that influence agricultural teacher educators to participate using Web-based technologies to deliver distance education in agriculture programs.

If you have already completed and returned the questionnaire, please accept my sincere thanks. If not, please do so today. I am very grateful for your help because it is only by asking people like you to share your experiences that we can understand the factors which influence agricultural teacher educators to participate using Web-based technologies to deliver distance education in agriculture programs.

If you did not receive a questionnaire, or if it was misplaced, please call me at 614-485-0968 or e-mail me at curbelo-ruiz.1@osu.edu and I will get another one in the mail to you today.

Aury Curbelo-Ruiz
Ph.D Candidate
2011 Harwich Road
Columbus, Ohio 43221