A QUALITATIVE STUDY OF TECHNOLOGY-BASED TRAINING IN ORGANIZATIONS THAT HIRE AGRICULTURE AND LIFE SCIENCES STUDENTS

Leslie Bedgood, Instructional Systems Designer
Theresa Pesl Murphrey, Visiting Assistant Professor
Kim E. Dooley, Professor
Texas A&M University

Abstract

Technological advances have created unlimited opportunities in education. Training and technology have merged to create new methods referred to as technology-based training. The purpose of this study was to identify organizations that hire agriculture and life sciences students for positions involving technology-based training and identify competencies required for these positions from the perspective of the identified organizations. This study describes the technologies that the identified organizations were using to design and deliver technology-based training, the audience to whom the organizations were providing training, and the competencies that the identified organizations were seeking in potential employees. Findings from this study revealed a need for individuals with specialized skills related to technology-based training. Findings specifically suggest seven key competencies needed to work in technology-based training: (a) instructional design, (b) technology/computer skills, (c) the ability to conduct a needs assessment, (d) interpersonal skills, (e) writing skills, (f) planning and organizational skills, and (g) evaluation skills. Study findings lead one to conclude that students with expertise in these competency areas are more marketable in organizations that hire agriculture and life sciences students.

Introduction & Theoretical Framework

Distance education is often perceived as a modern trend, while in actuality it has an extensive history throughout government, corporate, and education environments. According to Burgess and Russell (2003), distance education has evolved through four stages over the years, with each evolution resulting in increased effectiveness and a wider range of applications. These stages include: correspondence courses, audio and video conferencing, the pairing of multi-media with personal interaction, and two-way communication using a variety of cutting edge technologies. Saba (2001) referred to the current form of this type of learning by stating:

> For the third time in fifty years, distance education has been touted as the elixir that will cure all the ills in education and training. However, what is different is that never before has this much attention, money, publicity, and hope been invested in its practice in education and training. (p. 1)

According to Miller and Pilcher (1999), agricultural institutions were often leaders in distance education programs. Agricultural and land-grant institutions strive to reach those geographically dispersed and to provide lifelong learning (Irani, Telg, & Place, 2003). Historically, agricultural colleges have frequently experienced budget cuts, which can be accommodated by implementing technology and distance education in order to cut long term costs and increase revenue (Connor, 2003). When looking specifically at agricultural education departments, Roberts and Dyer (2005) indicated that approximately two-thirds of departments were implementing some degree of distance education courses.

The expansion of distance education programs has also extended into workforce training. In a recent survey conducted by

the Institute of Management and Administration, it was reported that "77.8% of survey participants…plan to expand…training efforts to meet expected company growth" (Sandler, 2005, p. 3). According to Amercian Society for Training & Development's (ASTD's) 2004 *State of the Industry Report*, classroom training has steadily decreased over the years, while an estimated 29 percent of training was conducted through technology-based methods in 2004.

Typical training has become unpopular in organizations because of its similarity to traditional school, which is viewed by some as a short-term memorization process rather than a learning process (Huseman & Goodman, 1999). Technology has created a learning environment that exceeds that of traditional learning (Brazen & Clark, 2005) and has significantly altered the way that training and development efforts are conducted (Garrett & Vogt, 2003). Delivery methods such as CD-ROM, audio, computer projection, and video conferencing continue to be used and new technologies such as interactive networks that provide web-based instruction (Rugelj, 2005) are becoming more predominant throughout organizations.

As organizations make the transformation into learning organizations, technology will facilitate in the sharing of knowledge (Duhaney, 2005). Research has revealed that agricultural professionals make up a significant number of the students enrolled in agricultural education distance courses (Miller & Miller, 2005; Roberts & Dyer, 2005). In 2000, organizations spent over 30 billion dollars on training, and as they begin to feel more pressure from the economy, they increasingly turn to technology (Lee, Bhattacharya, Nelson, & Kihn, 2002). Organizations will continue to turn to technology to reach people internationally (Garrett & Vogt, 2003), to prepare for organizational growth (Sandler, 2005), and to accommodate to learners' time, financial, and responsibility constraints (Duhaney).

Although organizations are converting to technology-based training methods, they are not replacing classroom training completely (Webb, 2003). According to ASTD's *State of the Industry Report* (2004), approximately 60 percent of training remains in the classroom. Blended approaches realize that technology-based training will not completely replace traditional training, while acknowledging that appropriate technologies will encourage success (Garrett & Vogt, 2003). The Sloan Consortium (2004) defined ways to offer courses using a variety of degrees of technology as traditional courses, web facilitated courses, blended learning, and online or technology-based courses. The most predominant method provided by organizations is a blended approach.

Goolnik (2002) expressed the importance of qualified and competent staff in order to create an effective program. With the increase of technology-based training there is a need for specialists that outweighs the supply of competent technology-based trainers (Foshay, 2001). Just as in academic settings where the importance of providing distance education training and support to faculty and staff has been documented (Murphrey & Dooley, 2000; Roberts & Dyer, 2005), organizations that plan to design and develop technology-based training should hire people with experience (Escoffery, Leppke, Robinson, Mettler, Miner, & Smith, 2005). The field of technology-based training is a multidisciplinary field that requires knowledge and experience in a variety of areas (Rugelj, 2005). With more people pursuing the field of technology-based training, it is critical to identify the competencies for the field (Murphrey & Dooley, 2006). Research has been conducted to identify the necessary competencies by Thach and Murphy (1995), Williams (2003), Egan and Akdere (2005), and Murphrey and Dooley (2006).

Thach and Murphy (1995) conducted research that studied the roles, outputs and competencies needed by distance education professionals within the United States and Canada. Williams (2003) conducted similar research, dealing with roles, outputs, and competencies necessary to implement and manage distance education in higher education. Both Thach and Murphy and Williams' studies found general competencies that were required across all

roles, which include: communication/ interaction, management/administration, technology, and learning and instructor.

Egan and Akdere (2005) studied distance education competencies by gathering information from advanced distance education graduate students. The graduate students surveyed indicated that technology competencies were the most important (Egan & Akdere), which differed from Thach and Murphy (1995) and Williams (2003), who indicated communication competencies as the most important skill set. Murphrey and Dooley (2006) expanded on previous studies by focusing specifically on competencies in the field of e-Learning by conducting a focus group study of current and past graduate students currently working or planning to work in the field of e-Learning. Like the study by Egan and Akdere, the most important skill set indicated was technology skills (Murphrey & Dooley, 2006). While there were similarities and differences across the studies, it is clear that three skill areas stand out: technology skills, organizational skills, and communication skills (Egan & Akdere; Murphrey & Dooley, 2006; Thach & Murphy; Williams, 2003).

With the spread of the technology-based training industry, new and diverse employment opportunities are surfacing, creating jobs and positions that require specific skills and competencies. As we consider this point, we need to ask the questions: To what extent are organizations that hire agriculture and life sciences students involved in technology-based training? What are the employment opportunities within these organizations for students with expertise in the development and delivery of technology-based training? And, what skills or competencies are needed for these positions?

Purpose and Objectives

The purpose of this study was to identify organizations that hire agriculture and life sciences students for positions involving technology-based training and identify competencies required for these positions from the perspective of the identified organizations. The following objectives were achieved in order to complete this study:

1. Identify organizations that hire agriculture and life sciences students that implement technology-based training.
2. Identify positions related to technology-based training available in the organizations identified as implementing technology-based training.
3. Describe the design and delivery methods being used to implement technology-based training in the organizations identified.
4. Identify competencies required for the identified positions associated with technology-based training.

Methods and Procedures

In this study, structural qualitative research was applied to gain perspective from current technology-based training professionals as to the "regularity in the organization of the phenomenon under study" (Tesch, 1990, p. 103). "…[S]tructural analysis assumes that the structure is actually inherent or contained in the data (Tesch, p. 103). Strauss (1987) suggested that researchers use sociological constructs based upon a combination of the researcher's scholarly knowledge and knowledge of the field under investigation. Previous studies (Egan & Akdere, 2005; Murphrey & Dooley, 2006; Thach & Murphy, 1995; Williams, 2003) served as the constructs for theoretical triangulation of the emerging themes for this study.

The purposive sample selected for this research included organizations identified by the Texas A&M University College of Agriculture and Life Sciences Student Council as interested in hiring agriculture and life sciences students. The original list represented 163 organizations; closer examination of the list reduced the number to 132 due to insufficient information. The group was purposely selected based on their interest in hiring students from the Texas A&M University College of Agriculture. Organizational recruiters served as the

gatekeeper because they were in a position to encourage organizations' participation (Berg, 2001). The gatekeeper, in most instances, provided access to the person most knowledgeable about technology-based training, though in some cases the gatekeeper was actually the person interviewed.

A systematic process was employed to identify the purposeful sample of organizations willing to contribute information to the study. A total of 132 organizations were contacted, with 59 interviews conducted. In some instances the researcher spoke with individuals within the organizations, but the individuals were unable to provide any information. If the researcher was unable to speak with an individual, a message was left when possible. Table 1 provides a more descriptive summary of the organizations contacted.

A semi-standardized interview guide that encouraged free digression, depending on the responses provided, was used as the primary data collection tool (Berg, 2001). The guide consisted of five open-ended questions designed to address the objectives of the study. With each question, there were also probes included to encourage the enticement of more in-depth information from the respondents (Berg).

Data was collected through semi-structured telephone interviews (lasting 25 minutes on average) and the content analysis of documents (e.g., job descriptions and documents obtained from organizations' websites) provided by interviewees. While face-to-face interviews were the preferred method, Berg (2001) stated that telephone interviews are appropriate when a geographical barrier exists between the researcher and the subjects to be interviewed. After ten organizations had been interviewed, a peer debriefing was held to review emerging themes and to develop a plan for contacting the remaining organizations. The data collection phase ended after each organization had been contacted at least twice and a final peer debriefing was held to determine if data saturation had been reached (Strauss & Corbin, 1998).

Table 1
Purposive Sampling Process: Interview Contacts Regarding Technology-based Training (N = 132)

Description	Amount	*N*
Total Number in Original List	163	
Deleted from List Due to Insufficient Information	31	
Total Number Available for Contact		132
Organizations Contacted Based on Use of Technology-based Training		
Indicated Use of Technology-based Training	24[a]	
Indicated No Use of Technology-based Training	35	
Organizations Contacted – Provided Information		59
Organizations Contacted – No Information Provided		2
Organizations Contacted – No Reply		71
Total Number Contacted		132

[a] One individual indicated the use of technology-based training, but did not provide any additional information.

To ensure trustworthiness of the research, multiple measures were taken. Credibility was established through triangulation and peer debriefings in order to increase the richness of the data and confidence in the findings (Berg, 2001; Erlandson, Harris, Skipper, & Allen, 1993). A coding system was implemented to provide an audit trail so that one could "determine if the conclusions, interpretations, and recommendations can be traced to their sources" (Erlandson, et al., p. 35) as a means of dependability and confirmability. Organizations were coded C01 through C55, agencies were coded A01 through A05, and documents were coded D01 through D04. To ensure trustworthiness of the interpretation of themes that emerged, codes were included in the findings. Thick descriptions were used in analyzing the data.

The data collected were analyzed using the mechanics of structural qualitative analysis (Tesch, 1990) and the constant comparative method (Glaser & Strauss, 1999). The smallest dynamic units that emerged were colored coded and clustered by recurring patterns or categories. Previous research was compared to the emerging categories at the conclusion of the initial category formulation as a point of comparison and theoretical triangulation.

Findings

To enhance the transferability of the research, a demographic profile of the organization is provided. The 59 semi-structured interviews revealed that 35 organizations currently were not using technology-based training. Purposive sampling allowed the researcher to focus on the remaining 24 organization that were using technology-based training. Most of the interviewees were in the information technology or human resource departments.

The organizations using technology-based training were primarily international companies (C03, C06, C07, C09, C16, C19,

C21, C25, C27, C29, C31, C32, C36, C41, C46, C44, C52, C55), with only a few national and state organizations (A01, A02, A04, A05, C18, C24). Organizations ranged from approximately 500 employees (C29) to greater than 240,000 employees (C21). The organizations were categorized into seven types (i.e., plant services, products and science; government agencies; food and beverage; medicinal; structural supplies; animal feeds; and agricultural information service). Table 2 provides a complete breakdown of the types of organizations.

Table 2
Audit Trail: Types of Organizations that Indicated the Use of Technology-based Training

Organization Type	Codes
Plant Services/Products/Science	C06, C09, C29, C32, C36, C46, C44
Government Agencies	A01, A02, A04, A05
Food and Beverage	C18, C21, C27, C41
Medicinal	C03, C07, C25, C52
Structural Supplies	C16, C31
Animal Feeds	C55
Agricultural Information Service	C19

Training was described by respondents as being provided primarily through the Internet (A01, A02, A03, C09, C16, C18, C24, C25, C27, C29, C31, C54). Another method that was widely used was CD-ROMs (A01, C06, C07, C09, C16, C29, C31, C36, C55, C53). One interviewee stated that they "use CD-ROMs to provide employees with a 'library' of modular training that is complete with assessments and immediate feedback" (C09). Methods less common throughout the organizations included intranet (C09, C16, C52), webinars (C19, C46), and satellite (A03). One organization (C31) specifically discussed blended learning as a method, while others indicated using the Internet for informal training purposes (C08, C32, C39).

The types of training provided through technology-based methods varied greatly. Training types were categorized into four groups: human resource training (e.g., safety (C06, C31); sexual harassment (C07, C46)), organization/industry specific training (e.g., policies and procedures (C19, C52); health plan training (C06)), professional development (e.g., interpersonal (D02); goal setting (C55)), and computer training (e.g., software applications (C29); Internet security (A03)). Table 3 provides an audit trail of interviewee responses to types of training being offered through technology-based methods.

Table 3
Audit Trail: Types of Training Offered Through Technology-based Methods

Description	Codes
Human Resource	A01, A03, C06, C07, C09, C21, C24, C27, C31, C36, C46
Organization/Industry Specific	A05, C06, C07, C09, C16, C18, C19, C24, C31, C36, C41, C52, C54, C55, D02
Professional Development	A03, C09, C21, C29, C31, C36, C55, D02
Computer	A01, A03, C19, C24, C25, C29, C31, C36, C44, C55, D02

Note. Interviewees could respond with multiple responses.

While some organizations acquired training from external sources, many were developing technology-based training internally. One interviewee stated that "technical training is developed in-house, but many of the software application training programs are 'off-the-shelf' training" (C09). It was revealed by some organizations that technology-based training was being created through the human resources department (A05, C25, C31). Respondents often mentioned training groups that worked with the information technology departments to create technology-based training (A02, C06, C09, C36, C52). Review of position descriptions from the organizations indicated titles for positions responsible for technology-based training as e-Learning Consultant (D01), State Recruiting and Training Manager (D03), and Instructional Designer (D04).

Interviewees were asked about skills specific to technology-based training positions. Skills ranged from general to more specific technology skills. Instructional design (C09, C16, C31, D04) and technology/computer skills (C18, C19, C31, D04) were the skills most emphasized by the interviewees. One interviewee stated that "instructional design is by far the most important skill" (C31). Additional skills that were frequently mentioned included: the ability to conduct a needs assessment (C09, C16, D03), interpersonal skills (C16, C18, C31), writing skills (C16, C31, D04), planning and organizational skills (C18, D01), and evaluation skills (C09, D01). It was stressed by one interviewee that "the three most important characteristics are the ability to perform accurately, completely, and concisely" (C16).

Conclusions, Implications, & Recommendations

The findings revealed that many agriculturally related organizations currently implement some form of technology-based training. Four types of organizations (i.e., plant services, products, and science; government agencies; food and beverage; and medicinal organizations) use technology-based training more than other types of organizations. Given this information, it was concluded that specific organizations, such as these, might have more job opportunities for those interested in technology-based training.

Considering that this study focused on a set of organizations with a specific interest, the study should be replicated, not only with another population of organizations that hire agriculture and life sciences students, but also with organizations in other industries. As educational institutions prepare graduates to work in the training industry, it is necessary that they understand training across industries. Are organizations in other industries implementing technology-based training? What competencies do these organizations perceive as necessary for someone working in technology-based training? What factors influence the adoption of newer methods?

As increasing numbers of organizations adopt the use of technology-based training, more organization specific training is desired. This requires the employment of individuals internally who possess the set of skills to oversee or create this training, which indicates an increased need for individuals with expertise in technology-based training. Documents collected from interviewees indicated three job titles for positions relevant to technology-based training: e-Learning Consultant, State Recruiting and Training Manager, and Instructional Designer. Based on these documents, one can conclude that position titles for technology-based training positions vary greatly. Given the diversity of these titles, as well as the variety of departments responsible for technology-based training (e.g., human resources, training, and information technology), individuals pursuing a career in technology-based training should explore an assortment of positions and departments. Findings revealed that external sources are being recruited to create and implement technology-based training for some organizations, which suggests opportunities in organizations specific to technology-based training.

Given the variety of job titles and departments related to technology-based training revealed in this study, further research is needed. A more robust sample of job descriptions relating to technology-based training should be collected and analyzed in order to more accurately identify job opportunities for graduates with expertise in technology-based training.

While organizations reported a variety of methods to deliver technology-based training, the internet and CD-ROM were found to be dominant delivery methods in the organizations interviewed. This finding may indicate a greater need for e-Learning specialists. On the other hand, some interviewees expressed that although they were conducting technology-based training, it would never completely replace traditional training. One organization specifically identified blended learning and its importance. These findings support that of previous research (Garrett & Vogt, 2003), that predict an increase in this type of delivery.

A wide variety of training was reported as being delivered through technology-based methods. Interviewees indicated that technology-based training was primarily being used for organization or industry specific training. In addition, computer training, human resource training, and professional development training were noted. Computer training was noted as a prominent type of off-the-shelf training provided through technology-based methods. Based on these findings, it was concluded that organizations that used technology-based methods were covering a wide variety of content.

The findings indicated that the key skills and competencies needed to work in technology-based training include: (a) instructional design, (b) technology/ computer skills, (c) the ability to conduct a needs assessment, (d) interpersonal skills, (e) writing skills, (f) planning and organizational skills, and (g) evaluation skills. Based on these findings, technology-based training competencies closely coincide with e-Learning competencies, with only adult learning theory not appearing as a key competency; yet, it was identified. As found in Murphrey and Dooley's (2006) study, the e-Learning field has unique competencies. This study may coincide so closely because most organizations interviewed use online methods of providing training to employees.

When comparing the current study to the previous competency studies (Table 4), it is apparent that computer skills, interpersonal skills, writing skills, and planning and organizational skills are important to any aspect of technology-based fields. As in e-Learning competencies, instructional design was specifically mentioned in this study as an important competency. Other studies mentioned similar competencies that are parts of instructional design, but only Williams' (2003) study indicated these aspects in the top ten competencies. Technology or computer skills, similar to the e-Learning competencies, cover a general area; whereas the other studies broke this area down into specific skills, which were all mentioned in their top ten

competencies. It is important to note that in previous studies evaluation and assessment skills have been treated as a single skill, but in the current study individuals expressed needs assessment and evaluation skills as individually important factors. Based on these findings, it was concluded that students with expertise in the area of technology-based training are more marketable in this field. It is recommended that colleges of agriculture and life sciences encourage students interested in technology-based training to take courses and programs to obtain these skills and competencies.

Table 4
Comparison of Technology-based Training Skills to Existing Literature

Technology-based Training Competencies	Murphrey & Dooley (2006)	Egan & Akdere (2005)	Williams (2003)	Thach & Murphy (1995)
Instructional design	Instructional design	Not in top ten; #16	Skills in development of collaborative student-focused learning environment	No Mention
Technology/ computer skills	Proficiency with computers and programs and interface design	Basic technology; Technology access knowledge; Knowledge of distance learning field; Multimedia knowledge; Software skills	Basic technology knowledge; Knowledge of distance learning field	Knowledge of distance learning field; Basic technology knowledge; Technology access knowledge
Needs assessment	Evaluation and assessment strategies	Not in top ten; #21	Not in top ten; #22	Not in top ten; #18
Interpersonal skills	Student/teacher relationship	Collaborative and teamwork skills	Collaboration and teamwork skills; Interpersonal communication skills	Interpersonal communication Collaboration and teamwork; Feedback
Writing skills	Written communication skills	Not in top ten; #13	Writing skills; English proficiency	Writing; English proficiency
Planning and organizational skills	Organizational skills	Organizational skills	Not in top ten; #12	Planning; Organization
Evaluation skills	Evaluation and assessment strategies (repeated)	Not in top ten; #21 (repeated)	Not in top ten; #22 (repeated)	Not in top ten; #18 (repeated)

Technology-based training is a complex and growing industry. As it becomes more prevalent across agriculture and life sciences industries, more detailed information should be collected regarding the extent to which technology-based training is being implemented and in regard to competencies required for positions within agricultural organizations. As technologies continue to change at a rapid pace, technology-based training should be continuously studied in an effort to remain current.

References

ASTD. (2004). *ASTD 2004 state of the industry report: Executive summary.* Retrieved July 10, 2005, from, http://www.astd.org/NR/rdonlyres/49A44CD8-2A3E-471F-B80E-42504F4A1726/0/SOIR_2004_Executive_Summary.pdf

Berg, B. L. (2001). *Qualitative research methods for the social sciences* (4th ed.). Boston: Allyn and Bacon.

Brazen, E. F., & Clark, C. D. (2005). Promoting interactive learning with an electronic student response system. *NACTA Journal, 49*(3), 11-16.

Burgess, J. R., & Russell, J. E. A. (2003). The effectiveness of distance learning initiatives in organizations. *Journal of Vocational Behavior, 63*(2), 289-303.

Connor, L. J. (2003). Cutback management for academic programs in colleges of agriculture. *NACTA Journal, 47*(1), 19-24.

Duhaney, D. C. (2005). Technology and higher education: Challenges in the halls of academe. *International Journal of Instructional Media, 32*(1), 7-15.

Egan, T. M., & Akdere, M. (2005). Clarifying distance education roles and competencies: Exploring similarities and differences between professional and student-practitioner perspectives. *American Journal of Distance Education, 19*(2), 87-103.

Erlandson, D. A., Harris, E. L., Skipper, B. L., & Allen, S. D. (1993). *Doing naturalistic inquiry: A guide to methods.* Newbury Park, CA: Sage.

Escoffery, C., Leppke, A. M., Robinson, K. B., Mettler, E. P., Miner, K. R., & Smith, I. (2005). Planning and implementing a public health professional distance learning program. *Online Journal of Distance Learning Administration, 8*(1). Retrieved October 19, 2005, from http://www.westga.edu/%7Edistance/ojdla/spring81/escoffery81.htm

Foshay, W. R. (2001). Can instructional design deliver on the promise of the web? *Quarterly Review of Distance Education, 2*(1), 19-34.

Garrett, L. A., & Vogt, C. L. (2003, Winter). Meeting the needs of consumers: Lessons from business and industry. *New Directions for Adult and Continuing Education, 100*, 89-101.

Glaser, B. G., & Strauss, A. L. (1999). *The discovery of grounded theory: Strategies for qualitative research.* New York: Aldine de Gruyter.

Goolnik, G. (2002). E-learning for smaller rurally based businesses: A demand-led challenge for Scottish educational institutions. *Online Journal of Distance Learning Administration, 5*(2). Retrieved October 19, 2005, from http://www.westga.edu/%7Edistance/ojdla/summer52/goolnik52.html

Huseman, R. C., & Goodman, J. P. (1999). *Leading with knowledge: The nature of competition in the 21st century.* Thousand Oaks, CA: Sage.

Irani, T., Telg, R., Place, N. T. (2003) The university of Florida's distance education faculty training program: A case study. *NACTA Journal, 47*(1), 48-52.

Lee, R. V., Bhattacharya, S., Nelson, T., & Kihn, M. (2002). *Re-Learning e-Learning*. New York: Booz Allen Hamilton.

Retrieved October 22, 2005, from http://www.bah.de/content/downloads/E-Learning.pdf

Miller, G., & Miller, W. W. (2005). Trends in learner characteristics and program related experiences associated with two off-campus agricultural degree programs. *Journal of Agricultural Education, 46*(4), 2-12.

Miller, G., & Pilcher, C. (1999). Desired and assessed cognitive levels of instruction: Are college of agriculture courses taught on campus and at a distance comparable? *Proceedings of the 26th National Agricultural Education Research Conference, Orlando, FL, 26,* 343-351.

Murphrey, T. P., & Dooley, K. E. (2000). Perceived strengths, weaknesses, opportunities, and threats impacting the diffusion of distance education technologies in a college of agricultural and life sciences. *Journal of Agricultural Education, 41*(4), 39-50.

Murphrey, T. P., & Dooley, K. E. (2006). Determining e-learning competencies using Centra to collect focus group data, *The Quarterly Review of Distance Education, 7*(1), 78-82.

Roberts, T. G., & Dyer, J. E. (2005). A summary of distance education in university agricultural education departments. *Journal of Agricultural Education, 46*(2), 70-82.

Rugelj, J. (2005). Workplace computer-supported network-based learning. In Howard, C., Rogers, P. L., Berg, G. A., Boettcher, J. V., Justice, L., & Schenk, K. (Eds), *Encyclopedia of distance learning*: *Vol. 2*. (pp. 1006-1011). Hershey, PA: Idea Group Reference.

Saba, F. (2001). *Why distance education will fail and harm higher education*. Retrieved October 31, 2005, from http://www.distance-educator.com/horizon live/saba_presentation.pdf

Sandler, S. F. (Ed.). (2005, April). How to use training to accelerate growth. *HR Focus*, 82(4), 3-4.

The Sloan Consortium. (2004). Entering the mainstream: The quality and extent of online education in the United States, 2003 and 2004. Retrieved October 19, 2005, from http://www.sloan-c.org/resources/entering_ mainstream.pdf

Strauss, A. L. (1987). *Qualitative analysis for social scientists.* New York: Cambridge University Press.

Strauss, A., & Corbin, J. (1998). *Basics of qualitative research: Techniques and procedures for developing grounded theory* (2nd ed.). Thousand Oaks, CA: Sage.

Thach, E. C. & Murphy, K. L. (1995). Competencies for distance education professionals. *Educational Technology Research and Development, 43*(1), 57-79.

Tesch, R. (1990). *Qualitative research analysis types and software tools*. London: RoutledgeFalmer

Webb, W. (2003). Who moved my training? *Training, 40*(1), 22.

Williams, P. E. (2003). Roles and competencies for distance education programs in higher education institutions. *The American Journal of Distance Education, 17*(1), 45-57.

LESLIE BEDGOOD is an Instructional Systems Designer for Karta Technologies, 5555 Northwest Parkway, San Antonio, TX 78249. E-mail: leslie.bedgood@gmail.com.

THERESA PESL MURPHREY is a Visiting Assistant Professor in the Department of Agricultural Leadership, Education, & Communications at Texas A&M University, TAMU 2116, College Station, TX 77843-2116. E-mail: t-murphrey@tamu.edu.

KIM E. DOOLEY is a Professor and Associate Department Head in the Department of Agricultural Leadership, Education, & Communications at Texas A&M University, TAMU 2116, College Station, TX 77843-2116. E-mail: k-dooley@tamu.edu.