Use of Technology by Cooperative Extension Agents

A Review of the Literature

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Introduction

The Cooperative Extension Service (CES) is a publicly funded non formal educational system of the Land Grant Universities. CES had its beginnings in the late 19th century when we were an agricultural society. The Agricultural Colleges (precursors to the Land Grant Universities) carried out their mission of bringing education to the people in farming communities through demonstrations as introduced by Seaman Knapp. Knapp later drafted the bill that became the Hatch Act which created agricultural experiment stations. Within two decades the Smith-Lever Act of 1914 which formalized the Cooperative Extension system was passed. The new CES’s purpose was to “aid in diffusing among the people of the United States useful and practical information on subjects relating to agriculture and homes economics and to encourage the application of the same…” Extension Agents employed by the Land Grant Universities traveled to farms to teach farmers to use new techniques, knowledge and concepts of modern agriculture and research based science. Early Extension education was offered by Agents during farm and home visits and small group meetings where new techniques were demonstrated to farmers, homemakers and youth (Seevers, Graham, Gamon, & Conklin, 1997). As the years progressed various technologies were introduced to Extension programming slowly. Telephone, radio and television were early technologies adopted to one degree or another, but the mainstay of Extension continued to be the farm and home visits and small group presentations.

Today we are no longer an agricultural community, but Extension is still a major educational delivery system for the Land Grant Universities. In today’s world,
technology has changed the way Extension does business but the mission has remained similar. Almost a century later the mission of Extension as defined by the Extension Committee on Organization and Policy in 1995 is “to enable people to improve their lives and communities through learning partnerships that put knowledge to work”.

In 1996 a commission funded by the Kellogg Foundation was created by the National Association of State Universities and Land-Grant Colleges (NASULGC) to help define the direction public universities should go in the future and to recommend an action agenda to speed up the process of change. The commission was charged not only with defining and bringing to public attention the kinds of changes occurring at Land Grant Universities today, but with analyzing necessary reforms and suggesting ways to accomplish them and monitor the results. The commission drew up a new concept (Third Report. Returning to Our Roots. The Engaged Institution, 1999) of lifelong learning that they defined as becoming a “learning society”. This learning society calls upon Land Grant Universities to help citizens extend their knowledge, understanding and skills through access to continuous learning, distance education and asynchronous education through the use of technology. The commission called upon Land Grant Universities to invest in technology and education for the faculty (which includes CES Agents). In a learning society the role of Extension Agent is no longer one of traveling to farms and homes to demonstrate new techniques. The new Extension Agent produces educational products and works in an information rich marketplace, therefore they will need new skills and competencies to succeed (Smith & Kelly, 1997). In their new role they work as communicator, facilitator, teacher and resource provider. This changing role means that
it is important to examine how Extension Agents function and interact with technology in their daily work of communicating, teaching and learning.

In response to growing demands from clientele and because of a need to become a more flexible and responsive “learning society”, Extension has made many investments in technology hardware and has looked for new ways to organize its staff to facilitate communication, and the diffusion of research based information. Extension administration has struggled with ways to use technology to help a restructured Extension Service deal with reduced staff and increased demand for education in a world where information is exploding (Harriman & Daugherty, 1992). Harriman says that “the computer has transformed education as radically as the printing process once did. Extension publications may become an archaic method of delivering information.” He goes on to promote the benefits of satellite technology which he says could bring national experts to local communities at little cost and he suggests that telecommunications networks will be the future of Extension. His prediction proved to be close but not completely on target. Major technology hardware and software investments to support this move toward becoming a learning society/organization over the past 15 years in Michigan were used to bring first video desktop conferencing and later satellite dish communications to county Extension offices. Unfortunately the fate of these two technologies to date has been similar to the fate of computers in the classroom as described by Larry Cuban and they remained oversold and underused. (Cuban, 2001) Michigan’s most recent attempt at using the latest technology to support Extension Agent programming is the purchase of a web portal system. Michigan’s portal was purchased in late 2003 and is schedule to be fully launched in April 2005. Will this new technology be
the silver bullet that transforms Extension from the age of farm demonstrations to a new era of technology enabled information transfer and support the concept of a learning society/organization? That remains to be seen.

An examination of published literature about how Extension Agents have or have not used technology reveals some helpful clues as to how to support this new endeavor. It also can point us to new research opportunities and needs. Extension administration must understand how and why technology is best used in the delivery of Extension programs and they must understand how and why Extension staff use technology (or don’t use it) in their work. Thus I examined the literature that relates to the Extension Agents as facilitators of technology in working with client, how they use technology themselves for in-service, learning and teaching and their attitudes towards technology. This literature is compared and contrasted to what we know about the use of computers and technology in other educational arenas such as public schools. Literature on Extension and technology was gathered from the Journal of Extension (the official refereed journal of the Cooperative Extension System), dissertation abstracts, ERIC and AGRICOLA (National Agricultural Library) using the terms and key words of Cooperative Extension, technology, distance education, staff development, agriculture education. Additional literature was collected via various electronic resources in education research.

Extension Agents Facilitation of Technology

Several articles in the mid nineties focus on the Extension professional as a linker and resource person to facilitate the use of technology to connect local communities and the Internet (Tennessen, PonTell, Romine, & Motheral, 1997). In one article, a description of a 1992 (DeYoung, Harris, & Larsen, 1995) project in Oregon is about
creating a virtual community made up of members of a governor’s advisory council who were charged with drafting policy for management of the Oregon coast line. Extension staff were instrumental in networking computers, creating an early listserve and facilitating discussion groups. And in rural upstate New York, the Cooperative Extension of Tioga County helped develop an Internet telecommunication consortium of local businesses and other stakeholders (Tennessee, PonTell, Romine, & W., 1997) in 1996. These examples demonstrate Extensions role as a community development change agent with their work to facilitate the use of technology rather than use it to educate clientele. It also shows that some Extension Agents are early adopters and enthusiastic about the potential of technology.

Extension Agents Use of Technology

Extension agents are users of technology when they participate in satellite or web based professional development. In 1998 and 1999 Internet in-service trainings were offered to county Extension agents in the Southeastern United States. Staff that participated were surveyed and their previous computer and Internet experience as well as acceptance of using the internet to learn was assessed. (Lippert, Plank, & Radhakrishna, 2000) A subject matter in-service on soil acidity and liming was offered to 150 county Extension staff from six states. The objective was to determine if the Internet could be used successfully for distance instruction. Agents were given pre and post tests to determine their knowledge gain as a result of participation which clearly demonstrated that they did gain knowledge. A list serve was also used for discussion, but only thirty-one agents participated with some sending only one e-mail for a total of 168
e-mails. At the end of the training participants were asked if they thought “the use of the internet can provide a leaning experience as effective as a face-to-face class” and 55% agreed or strongly agreed. The researchers propose future testing to incorporate questions on learning style to see if there is a correlation between participant’s personal learning style and their ability to use and attitude toward the use of the Internet for learning.

The campus Extension staff of Pennsylvania State University was interested in the perception of distance learning by Extension county agents because they believed it might be a more cost effective way to deliver in-service education. (Kelsey & Mincemoyer, 2001) A mail survey was sent to all full-time county Extension staff in Pennsylvania (n=269) and with no follow-up reminder had a 85% response rate. This high response rate indicates a strong interest in the subject although an interest may not mean a positive one. Staff reported spending an average of 8.9 days on in-service education per year and indicated that the preferred regional face to face in-service over both going to campus and over locally offered distance education (satellite) delivery. One complaint about distance education via satellite was that it made it difficult to get to know other staff. However the majority indicated that they were willing to attend a limited number of satellite education in-service offerings if it saved them driving time. As a result of this survey Penn State began a pilot program of quarterly satellite in-services and in three years eleven broadcasts had been made with a total audience of 535 Extension county staff.

Several studies of the usefulness of the Web and e-conferencing as learning tools for Extension in-services have been done since 2001. (Muske, Goetting, & Vukonich,
and (Twidwell, 2004) with the subject matter ranging from couple relationships to a course in forage crops. One was a study of a graduate level class for Extension agents who wished to specialize in a given field of study (Twidwell, 2004). It used compressed video broadcast from the campus combined with group projects in which the students had to research information via the internet to analyze a forage-based production problem. At the end of the course when asked what type of in-service they preferred, 80% chose the traditional face-to-face in-service however the majority (68%) said they would take additional courses taught via distance education even though they preferred other (low technology) methods.

Another study was an e-conference for Family Life agents (Futris et al., 2004). White papers from experts in the field were posted on-line and were available two weeks before the e-conference. Then participants logged on to use a bulletin board to converse via the computer. Most of the participants read the postings but only 44% posted comments and questions. Following the conference 30 agents completed an on-line evaluation in which 90% said they would use e-conferencing again although many said that they would need to set aside more time for it the next time they participated since they found it difficult to participate and balance work and home obligations at the same time.

Using the Web as a training tool and resource for Extension agents was the objective of a study of the use by agents of a family resource management site. (Muske et al., 2001). Existing Extension written materials were changed to be incorporated into a Web based interactive and self paced learner-directed experience. The design was to be
used not only for learning the subject matter but also as a resource once the course was completed. There were two different curriculums provided on the site, one being how to use a web site for those with little or no experience in Web navigation and the other more specific to the program with a tour through existing family resource management Web sites as developed by Extension, government agencies, non-profits and commercial businesses. The initial training for the use of the site was done at a central location in a computer lab. A total of 55 Extension educators attended the trainings and 16 (29%) completed an on-line evaluation form. The Extension educators indicated their use of the Web as a resource and 76% said they used it daily, with the rest saying they used it two or three times a week.

After the initial training the site was maintained but campus staff reported that it was time consuming and complicated to do so because web links have to be updated and new resources found and added. Such a site however does give Extension the ability to be not only a resource but to screen links to help direct clientele (and staff) toward reliable researched based information and seems to be similar to the kind of information or educational technology that is promised by a web portal presence.

In a paper presented at the Families, Technology and Education Conference in Chicago Illinois in 1998, Swanson (Swanson, Mead, & Haugan, 1998) reported on a New York State Cornel CES project which sought to support development of computer literacy among staff and program participants through a five year project. They conducted base line and follow-up studies on Internet use. The researchers report large gains in the use of the Web for program support and increased project communication. They believe that in order to continue to be successful in the project they need on going
training, more computers and local Extension contacts for problem solving. Challenges identified by the researcher were the need for ongoing technical support and assistance, as well as a need to market and promote the use of computers and technology since they found that many staff didn’t use resources available to them because they simply did not know they existed.

Technology training needs of Texas CES Agents was the focus of a doctoral dissertation by Brenda Albright (Albright, 2000) which was published in 2000. Albright compared and contrasted CES Agents who use technology a lot and those that are non or seldom users and tried to identify training that might help non or seldom users become more proficient and frequent users of technology in their work. This is perhaps the most extensive research on the use of technology by Extension staff that has been reported to date. Albright found that overwhelmingly Extension Agents reported not having taken an in-service class on technology in the past two years and that they have taken few if any during their career. Reasons given were lack of time and lack of access. Training had been offered by Extension but apparently was not the kind of training Agents perceived they needed or wanted. She also found a relationship between age and technology use with younger agents reporting that they used technology more and had better skills than older agents. When asked what kind of training they would prefer, they indicated a preference for web-based training. And all Extension Agents in the study ranked video and distance learning as their lowest preference for skills training. Albright believes based on adult learning theory that the biggest impediment to learning technology is actually that Extension Agents don’t see a need for it. She believes that if they really wanted to learn about and use technology they would make the effort to find the time and to access the
courses offered. Therefore motivating Extension Agents and showing them the potential of technology may be an important factor in their future use or non use.

Extension Agents Interest in and Attitudes towards Technology

Familiarity and comfort with technology are essential to Extension educators if they are going to use technology in their teaching and work so articles on the use of technology for in-service training of Extension staff may be an important indicator of their willingness and ability to use technology in their work.

Finding out what interest Extension county staff may have in learning at a distance is important information for policy makers on campus. One study was done to ask Extension staff what they would like to pursue (and how) regarding continuing education. (Edwards et al., 2004) All Extension agents in Georgia (n=365) were surveyed to find their level of interest in distance educational programming for their own professional development. Of those who replied, 74.8% reported a general interest in pursuing additional education at a distance, with 58.8% interesting in a graduate degree earned at a distance, 43.7% in a certificate program and 66% a specific course. This indicates a high degree of interest in distance learning by Extension professionals. The same agents were asked about their perception of their own competence with computers and a correlation was found to their interest in distance education. As the agents perception of competence increased so did their interest in pursuing a graduate degree via distance education.

Interestingly this contrasts with a study that indicates that Extension staff members believe that their clientele prefer different means of learning than they do.
(Rodewald, 2001) In 2001 surveys were sent to 100 Extension agents and district specialists and 59 Ohio Department of Natural Resources (DNR) staff members to ascertain their perception of six delivery methods of educational materials. They were asked to rank their preferences and their perceived preferences of their clientele. The delivery methods were; printed fact sheet, printed bulletin or manual, on-line information, conferences and workshops, seminar and video. Extension county agents and DNR professionals preferred printed fact sheets first followed by on-line information. Least desired was seminars and video. However when responding regarding their clientele desires they ranked printed fact sheets first followed by manuals, newsletters and then on-line information. Seminars and video presentations were least preferred. The researcher says that reasons for these choices may be that Extension agents are expected to know about a wide variety of subjects and have up to date information. Since information changes rapidly the fact sheets can be changed and updated and mailed or handed out to clientele with minimum expense or effort. This contrasts with the perceived high degree of difficulty and amount of time needed for workshops and distance education.

However other research journal articles pointed to acceptance by Extension clientele of educational programs delivered via technology and distance learning. A Verbal Interaction Category System was used to compare and contrast traditional and satellite delivered programs of Master Gardener training programs in Oregon (Rost, 2000) In this study interactions levels of students and their instructors was found to be approximately the same whether the program was delivered via satellite or in a traditional face-to-face workshop format When asked if they were satisfied with the amount of interaction with the instructor 91% of 151 participants in the traditional program agreed
or strongly agreed and 93% of 147 participants in the distance session agreed or disagreed. This suggests that distance education programs offered by Extension may be accepted by clientele. This leads to the question of why Extension Agents believe that clientele prefer a low technology approach.

It may be that Extension Agents experience or have more anxiety about technology (and computers) than is commonly believed. Two different doctoral dissertations examined computer anxiety in Extension Agents and concluded that Extension Agents did feel anxious. Martin, Stewart and Hillison (2001) report that in Martin’s doctoral research (Martin, 1998) Martin found that more than 44% of Virginia Cooperative Extension personnel responding felt very anxious, anxious or mildly anxious and it was secretaries not Extension Agents who reported the least amount of anxiety. There was also a correlation of age and anxiety with older Extension Agents feeling more anxious than younger ones.

In another doctoral dissertation (Emmons, 2003) the researcher examined the personal attributes and other factors that might influence attitudes and expressed communication preferences of North Carolina Extension Agents. The study specifically investigated the relationship of personal attributes (age, gender, level of formal education, work experience, ethnicity, personality type and other factors such as job responsibility, computer experience) in relation to computer anxiety, computer thoughts and communication preferences. The researcher surveyed all county based Extension Agents in North Carolina and found that computer anxiety did exist and was influenced by gender, age, level of education, computer experience and job responsibility. Emmons recommends further study of the issues of anxiety and computer and technology use and
cautions that further research should be done using a non computer method for collecting data so as to reduce bias caused by respondent being somewhat self selected.

Conclusions and Recommendations

From this review of the literature it is obvious that there are some Extension Agents who are enthusiastic early adopters of technology. However there seem to be many more who do not adopt technologies to a great extent in their work. Many Extension Agents still express a preference for face to face in-service learning for themselves over technology enhanced alternatives. Barriers to the use of technology seem consistent with those barriers that teachers describe (Becker, April 2001). They are; too little time available, lack of appropriate training and a perception that it is too difficult and not what their clients need or want. The literature shows a correlation of age and prior computer experience to interest in using technology. Younger Agents and those with more experience and expertise in the use of computers were more apt to use technology and perceive it as useful and beneficial. And finally at least three different studies in the past five years found that computer anxiety existed among Extension Agents. This anxiety correlated with age, job description and computer experience.

Clearly if Extension is to make better use of technology to become the flexible, responsive organization that they hope to be and if they are to become a true “learning society” which helps citizens extend their knowledge through access to continuous learning, distance education and asynchronous education, then Extension will need to do a better job of research the needs of Extension Agents so that they can find ways to support them as they learn to embrace technology in their work.
References


