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Using Information Technology to Forge Connections in an Extension Service Project

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Abstract: A hybrid Extension project is introduced that uses a traditional Extension delivery model without the complete infrastructure of Cooperative Extension Services. The absence of this local organizational support and infrastructure necessitates new thinking regarding how Information Technology (IT) can support this project and hybrid Extension projects in general. The reciprocal relationship between offline and online tasks and how an Internet portal can serve as a centralized location for project continuity is offered as one solution. How IT facilitates the implementation of hybrid Extension projects such as this one can further

promote the interdisciplinary adoption of the Extension model.

Introduction

There is an increasing role for Information Technology (IT) in both domestic and global Cooperative Extension Services. Examples of this include eXtension (ATI, 2010), virtual Extension and e-communities (MEAS, 2011), and the use of Cyber Extensions in agricultural and rural development (DOASL, 2011). Extension addresses diverse needs and continues to be on the forefront both in community-based learning and the use of IT for public information and outreach. Though it has an increasing presence in Extension Services, the use of IT to deliver and/or support the delivery and evaluation of local U.S. Extension programming is new and under-tested (Seger, 2011). This increase in the presence of IT is occurring simultaneously with the multidisciplinary adoption of the Extension model for program delivery.

Formalized in 1914 to extend "land-grant expertise to the local level," the Extension model remains a powerful and necessary model for community change (USDA, 2010). As several funding agencies adopt and augment Extension practices for program delivery, the Extension model has become a multidisciplinary approach. Multidisciplinary Extension projects usually implement the Extension model without the full Extension infrastructure in place. This presents the challenge of doing more with less: successfully providing program delivery, collaboration, and evaluation with fewer face-to-face local workflow support services. Presented here is the use of IT in the communication, development and assessment of a multi-state, community-based Extension project that reaches a rural audience: the National Science Foundation-funded, Appalachian Information Technology Extension Services (AITES) Project (NSF GSE/EXT #0522767).

This article describes how the AITES Project team (hereafter the Project team) conceptualizes and uses IT to support programming and evaluation efforts. This includes facilitating connections within a multilayered, geographically distant project infrastructure and supporting workflow by bridging online and offline tasks. To do so, this article offers a discussion about the benefits of using IT to increase project efficiency and lessons learned about the effective integration of IT in a large project such as AITES.

The Appalachian IT Extension Services Project

AITES is a 5-year Gender in Science and Engineering Extension Project that was funded by the National Science Foundation (NSF) in October 2008. Using the Extension model, AITES (hereafter the Appalachia IT Project) consists of a university project team that includes four Trainer/Consultants. The Appalachia IT Project also includes 10 Community Cohort Teams (local teams), spanning 10 counties in five states in the Appalachian region of the U.S. These local teams consist of superintendent-nominated middle and high school teachers and school counselors, and Family and Consumer Science (FCS) and 4-H agents selected by their District Directors. Each state has a Trainer/Consultant who lives in or near the community she or he serves. The Trainer/Consultant is a key project team member who helps the local Community Cohort Team(s) implement project activities.

The Appalachia IT Project is a comprehensive, research-based Extension program of training and consulting services promoting underserved young women's interest in local and regional jobs requiring IT skills. The goal is to develop community capacity through a sustainable program of change concentrating on educating the teachers, school counselors, and parents about local IT jobs and related educational preparation for such jobs. As these community members significantly influence the career paths of the region's young women, enhancing their awareness of IT careers is an important focus of the initiative.

The Appalachia IT Project uses a Train-The-Trainer model to facilitate the adoption of new information in a community by first developing and training local teams of community-based trainers who, in turn, train their counterparts in their local community using their trusted social networks. The Project team trains local team members in each state at annual workshops held in their community and provides them with mini-grant funding to conduct their own training of peers. Community capacity (Mancini, Bowen, & Martin, 2005) and the Learning Partnerships Model (LPM), (Baxter Magolda, 2001) are the core notions in the model that local team members use in their training to build a career support network for female students, as well as foster their interest in IT-related jobs and careers.

Community capacity is built when partnerships among parents, schools, local IT industry, Extension, community economic development professionals, professional associations, and other key community stakeholders are established; local awareness of IT opportunities is increased; and attitudes toward IT jobs and girls involvement in IT is enhanced.

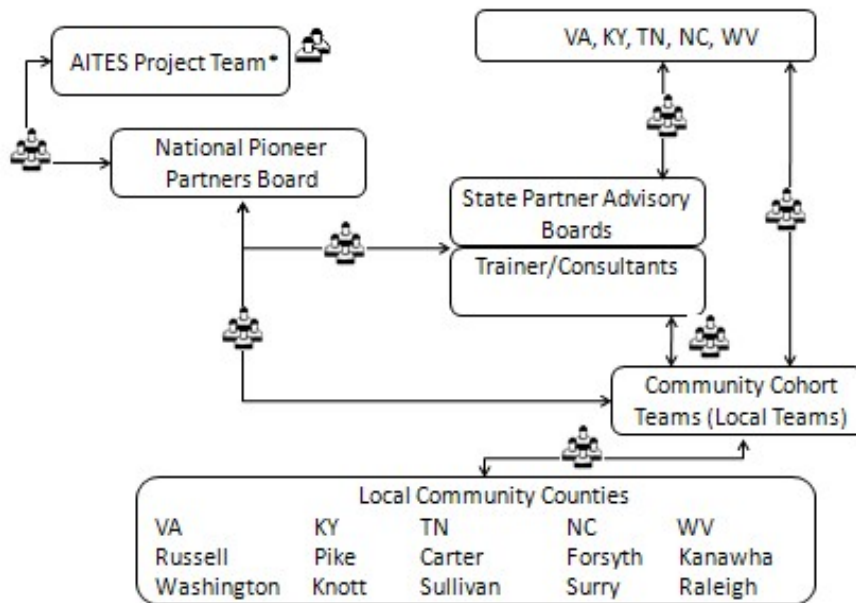
Both Community Capacity and the LPM build from and rely upon social interaction. In order to be successful as an Extension project, the Appalachia IT Project depends on connections: unique pathways of knowledge transfer (Oliver, 2009) that form and facilitate project development. For IT to play a role in this project process, the structures that facilitate interaction and feedback among team members must be explicit so that technology can be used to support project connections (Schneider & Evans, 2008).

From the planning stages, the Project team pursued how IT could be a "sustaining technology" (Coates, 2004, p. 1) that offers a venue for facilitating project infrastructure, such as providing communication channels, disseminating information, and connecting participants with each other and with relevant resources. The solution for this sustaining technology is the portal that provides a location for disseminating and collecting information and providing participants with additional ways to connect with each other. The portal is a site at <<http://www.aites5.org>> that provides access to other websites, databases, and support for day-to-day workflow, along with regular website functions such as presenting information and providing an Internet presence. The project team considers the portal a bridge in the Appalachia IT Project's communication network. It connects offline and online tasks, making it "the bridge between where knowledge originates (the project team and literature) and where it is applied (local teams)" (Oliver, 2009, p. 64).

Using IT to Forge Connections

The Extension model is most apparent in the Appalachia IT Project framework, which is a multilayered infrastructure with feedback loops (Figure 1). The Appalachia IT Project is a hybrid: a traditional Extension model coupled with a geographically dispersed and remote organizational support structure. Most of the Project team is located on a university campus and approximately 100 miles from the nearest project county. The Trainer/Consultants are the only Project team members in residence: residing in the two-county area where they supervise the local teams for the Appalachia IT Project. While the Trainer/Consultants and local team members are located within the targeted county areas, the rural nature of these communities may also involve geographic barriers, as well as distances.

Figure 1.
AITES Infrastructure



*The AITES Project team is comprised of the PI, Co-PI, Content Specialists, External Evaluators, Program Manager, and Trainer/Consultants.

The portal meets the challenge of connecting these disparate participants with an interactive Web presence where an exchange of information is possible within several different contexts (e.g., chat rooms, newsletters, individualized team Web pages). Google analytics from the origination date of February 2009 to March 2011 indicates success in attracting both project participant and public traffic. During this time frame there was a total of 61,914 visits, with an average of eight pages viewed per visit. Sixty-one percent of this traffic is direct traffic (project participant use), while the remaining 39% is other (public) traffic. A site usage monitoring system within the portal was developed in January 2010 to determine specific use. During this time period, the project team had the greatest usage, with a total of 10,057 hits. Local Team members were the second most frequent portal users, with a total of 4,827 hits.

Supporting Workflow by Bridging Online and Offline Tasks

Content pages on the portal with the most site visits indicate that workflow is the portal's main function. The 51 primary users of the portal are project participants: the Project team, including the Trainer/Consultants, and local team members. The parts of the portal most commonly accessed by the Project team were administrative or team access pages such as the team portal, site administration, and mini grant reports. The parts of the portal most commonly accessed by local team members were resources and forms such as the resource library, mini-grant application, project evaluation documents, and local team resources.

Additionally, the site usage monitoring system revealed that the AITES portal chat room received 117 hits for informal discussions between Trainer/Consultants, and between Trainer/Consultants and their local team members. These discussions included explanations of resources, strategies for implementing activities, and instructions on evaluation. While this data suggests the practical application of portal usage to workflow, it fails to demonstrate the relationship of this workflow support to the interwoven nature of online and offline tasks (Green 1999; Heath, Koch, Ley, & Montoya, 1999; Nip, 2004; Wilson & Peterson, 2002) inherent in

this project.

Using IT to facilitate the Appalachia IT Project requires the provision of a communication network (i.e., necessary connections, information, and feedback) so that project participants are able to fulfill their roles. To do so it is necessary to identify the specific needs of various stakeholders and to envision what tasks, resources, and communications can be online versus offline. Presented here are select examples of the mini-grant process to illustrate how the Project team thought holistically about how the portal would support project participants' workflow (Table 1).

Table 1.

Select Examples of Identified Online and Offline Aspects of AITES Mini-grant Project Tasks

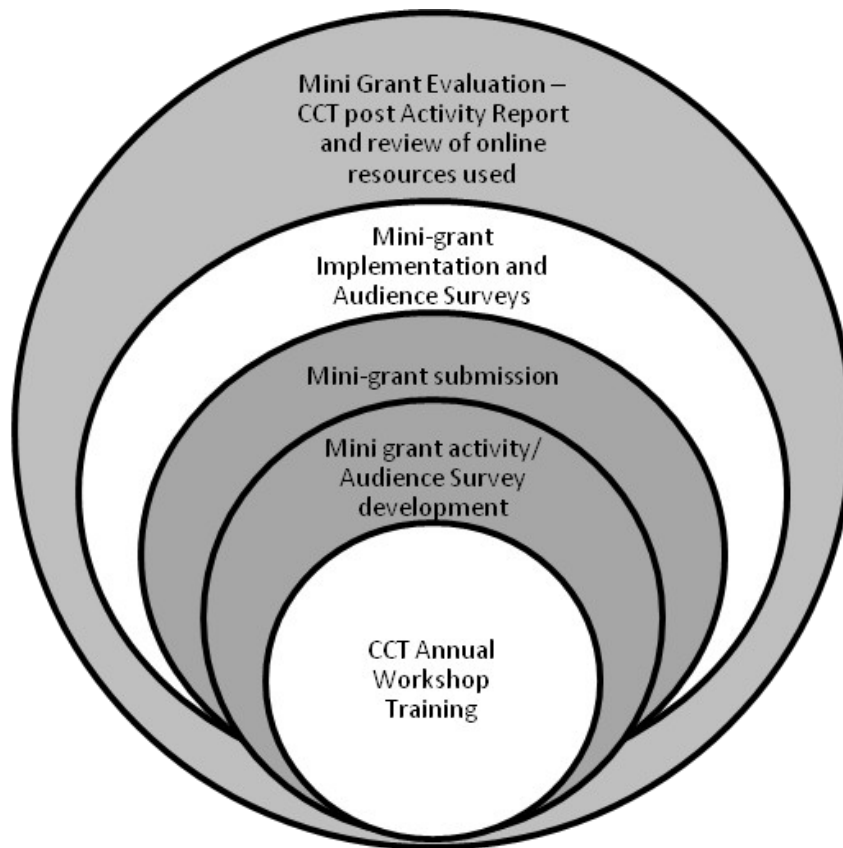
Stakeholder	Online Task	Offline Task
Trainer/Consultant	Supervise revisions to mini-grant submissions	Attend mini-grant activities
AITES Project Team & Evaluators	Review of mini-grant submissions, creation of audience survey	Provide/Revise workshop training
Local Teams	mini-grant submissions, post-activity report	Implement mini-grant activities and evaluation

Conceived to provide both input and output, the portal supports a bi-directional communication network that facilitates offline project activities. Input relates to interfaces in the portal where project participants enter information and post items or communicate with others. Output consists of resources, information, news, and project information created and posted by the Project team for the local team members. Offline tasks refer to face-to-face activities, people in physical proximity where communication is NOT through the computer. Online tasks refer to computer-mediated communication, workflow, and information. The goal then is to use IT via the portal to establish online communication, provide access to forms and resources, collect reports and field experiences, and share news, information and project announcements— all activities that facilitate project participants' workflow needs.

To conceptualize how the portal fits into the communication needs of the project, the design evolved with an understanding of online and offline tasks as different yet interdependent tasks for the project (Birkenmaier, Wernet, Berg-Weger, Wilson, Banks, Olligens, et al., 2005). For example, local team members, External Evaluators, and the state Trainer/Consultants develop and refine mini-grant submissions and audience surveys online (Figure 2). Local team members then implement mini-grant activities and audience surveys offline. Local team members also evaluate their own activities online. The Project team reviews the project processes, outcomes, and results (derived from these evaluations) in order to refine future implementation, including annual workshop training.

Figure 2.

An Example of AITES Online and Offline Interconnections



Gray â Online White â Offline

Using the notion of a bridge, the portal is an online mechanism for workflow support and for the multi-site project. As previously mentioned, the project team is located approximately 100 miles from the nearest project county. The Trainer/Consultants facilitate the online review process for local team members' mini-grant activities. Trainer/Consultants receive online feedback from the university-based Project team members and then help their local team members (both online and offline) to develop and evaluate their proposed activities. It is crucial that the use of IT is geared toward the support of what project participants need to do, to identify who they need to communicate with, and to understand what they desire to know about the project (Levine, 1995). It is important to support communication among project participants, not only because it facilitates this work, but also because the project outcomes reflect goals to both share and gather information from the field, which the portal makes possible.

There are many benefits to using an Internet portal to explicitly support the day-to-day activities of a project such as this one. For example, benefits of the portal for the mini-grant process, as stated in informal feedback solicited from the Trainer/Consultants, include:

- Accessibility of project information and resources
- Ability to explicitly gather and display information and best practices from the field
- Ability to use the database to track the progress of local team members' submissions and evaluations
- Ability to edit local team members' submissions

- Central archive of mini-grant reviews from several reviewers
- Ability to work remotely

The Trainer/Consultants self-reported that compared to other projects they have worked on, the portal significantly increases their work efficiency by decreasing their need to:

- Communicate with local team members over the phone
- Travel to meet with local team members
- Track team members' progress and revisions
- Store, distribute, and/or print resources and other project-related documents

These benefits are especially relevant with project participants such as those in the Appalachia IT Project. While they experience training in local face-to-face workshop settings with the Project team, local team members are developing, implementing, and evaluating activities locally while physically separate from the team. They use IT to facilitate their connection with the Project team after the initial training workshops are completed.

Challenges to IT adoption in the Appalachia IT Project are relatively low because most of the project participants use their work-related computers and Internet connections for their project activities. Trainer/Consultants required the provision of laptops, DSL connections, and project email accounts. Local team members receive technical support from the Trainer/Consultant and also from the Program Manager.

Recommendations

IT can forge connections for technology-enhanced Extension projects by bridging the communication, information, and feedback needs of geographically dispersed project participants. IT in the form of a portal also provides a uniquely accessible, yet centralized location for program delivery. Serving as a project repository, the portal is a powerful tool for disseminating information and feedback to the field, collecting and displaying project participant generated resources, information and feedback, and motivating participants in their project-related work.

The conceptual process of weaving online and offline tasks together in the Appalachia IT Project is evolving. The Project team's thinking about how IT and the portal can provide support progresses along with the project. As time elapses, notions of how to use the portal expand. For example, feedback from local team members informed revisions to the online mini-grant application form. Feedback from External Evaluators identified a need to create a usage report to increase the quality and scope of the data available regarding the portal's use and access. Specific support needs for online tasks became evident, and portal training became part of the annual workshop offerings. Resource booklets made available to project participants provided an offline document of what was available online, as well as showed how to navigate the portal. Essential to the success of using IT for the Appalachia IT Project was the budgeting of funds for portal revisions after the pilot year.

The most necessary considerations of using IT for projects such as the Appalachia IT Project are to:

- Make project processes, connections and activities explicit
- Consider the unique opportunities IT offers regarding dissemination, information, evaluation, and feedback
- Examine project processes, connections, activities, and opportunities as interconnected online and offline tasks
- Determine what tasks can go online and what must remain offline
- Identify the training and documentation necessary for successfully supporting online tasks
- Prepare for ongoing revisions to online project offerings and feedback from project participants

The goal for the Appalachia IT Project is for online tools, communication, and resources to facilitate existing offline activities and relationships. Online and offline tasks are viewed as aspects of the continual project processes and actions that take place on multiple levels and places in the day-to-day life of Extension projects like the Appalachia IT Project. Online support both augments and anchors face-to-face project activities. Likewise, a holistic focus on both online and offline tasks allows the Project team to see all aspects of the communication network: how to make better informed decisions about revisions to project procedures, workshop offerings, and supporting documentation, and how to better serve project participants and enhance overall project outcomes.

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