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Lessons Learned in Global Videoconference Training: Action Research at a Community-based Organization

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ABSTRACT

The U.S. videoconferencing market is expected to reach \$3.1 Billion dollars in 2008, a 121% increase from its 2003 level. As videoconferencing moves from the high priced ISDN-based services to the low-cost IP-based services it may make videoconferencing a competitive alternative for global training.

In this research lessons learned in the first nine months of a three-year longitudinal study are discussed in four areas: train-the-trainer model for countries with developing economies, infrastructure challenges in countries with developing economies, cultural barriers, and the role of community-based organizations. The results indicate that factors like Internet infrastructure, time zone differences, and cultural differences as inhibitors for global distance learning. In addition, preliminary findings show technology-use mediating activities including establishment, reinforcement, adjustment, and episodic change as enablers of video-based training. The study also assesses the key role community-based organizations play.

Keywords:

Community-based Organizations, Communities of Practice, Countries with developing economies, Distance Learning, Organizational Learning, Videoconference

INTRODUCTION

The U.S. videoconferencing market is expected to reach \$3.1 Billion dollars in 2008, a 121% increase from its 2003 level of \$1.4 Billion dollars (Knontzer, 2003). As videoconferencing moves from the high priced ISDN-based services to the low-cost IP-based services it may make videoconferencing a competitive alternative for global training. Training using videoconferencing technologies has been found to be successful (Clifton, 2003). The current study focuses on a two-way videoconferencing training program being conducted between the U.S. and a developing nation, Ethiopia. The training is coordinated by community-based organizations (CBOs), sometimes referred to as nonprofit organizations or non-governmental organizations (NGOs).

Two non-profit organizations Bethany Negash Memorial Foundation, Inc¹ and Ethiopian North American Health Professionals Association, Inc² organized training on HIV/AIDS Medical Management by coordinating experts from Johns Hopkins University, MAYO Clinic College of Medicine, Detroit Medical Center, and Kennesaw State University. The HIV/AIDS pandemic is wrecking havoc worldwide. This is most evident in countries with developing economies where economic disparity limits access to treatment and care. To address this pandemic the training is designed as “train-the-trainer” model whereby senior physicians in Ethiopia, trainees, are trained by experts in the U.S. to prepare them for training others locally.

The current study is part of a larger longitudinal study planned to reach several countries with developing economies over a three-year period. The complete project will link several institutions and skilled professionals from industrial countries through videoconferencing. The current study focuses on the challenges and lessons learned during the first nine months of this three-year project. The specific training program in the current study is a six weeks, two-hours per week, training provided to physicians in Ethiopia. Twenty-one senior physicians from Ethiopia registered for the training. The training is conducted using a two-way videoconferencing technology with Kennesaw State University serving as the videoconference gateway. Nine locations in the U.S. and one location in Ethiopia were connected through the gateway.

¹ www.BethanyMemorial.org

² <http://www.enahpa-dc.com/>

The current study reports on action research study in which the author engaged as technology coordinator (leader) and action researcher. The author facilitated and created an environment that allowed videoconferencing in nine geographically dispersed areas while at the same time studying how the group adapted to the new technology.

The research questions for the current study are: (1) What are the lessons learned when conducting a two-way global videoconferencing? (2) What are the roles of community-based organizations in facilitating technology diffusion?

THEORETICAL BACKGROUND

Three literature bases formulate the theoretical underpinning of the current study: (1) communities of practice, (2) technology diffusion, and (3) organizational learning.

The Global videoconference under investigation links skilled professionals from the United States to countries with developing economies. For organizational learning to occur information has to be acquired and distributed (Huber, 1991) and high level of organizational performance requires information technology development (Mankin and Cohen, 1996). In industrial countries technology diffusion has shown a significant positive impact on GDP (Jalava and Pohjola, 2002; Oliner and Sichel, 1990; Pohjola, 2001) and IT investment has greatly contributed to the economic growth of the United States (Sichel, 1997). Understanding success elements in technology development and how they can be transferred for countries with developing economies is important (Baliamoune-Lutz, 2003). The theory of community of practices provides the link for creating organizational value (Lesser and Storck, 2001) by using technology like videoconferencing to link skilled professionals in industrial nations to countries with developing economies. Together organizational learning, technology diffusion, and community of practices provide the theoretical basis for the current study.

In communities of practice individuals who belong to different organizations come together as a reason of their practice that binds them (Wenger, 1998). Participants of the current study come from many different organizations. They are however, joining forces for the common interest of educating underserved communities. The American Productivity and Quality Center (APQC) posits that “Communities of practice, this fast-growing socio-economic life form, become not only a potent source of value creation in today’s knowledge economy, but also the model for the very future of the modern organization Communities of practice are here to stay.” (Por, 2004). Groups that engage in sharing and learning through communities of practice create organizational value (Lesser and Storck, 2001) supporting the notion that “[Communities of practice] are becoming the core knowledge strategy for global organizations” (APQC, 2004).

In communities of practice working, learning, and innovating must be closely and realistically linked in theory and practice. Work, learning, and innovating are interrelated and compatible, and are potentially complementary (Brown and Duguid, 1991). Communities-of-practice emerge and evolve in organizations as practitioners collaborate and share work experiences through extensive use of narration about issues and problems involved in doing the job (Mathiassen, 1998, p. 88).

Technology diffusion plays a critical role in economic growth (Barro and Sala-i-Martin, 1997; Grossman and Helpman, 1991). For countries with developing economies technology adaptation can provide better economic opportunities (Lee, 2001). Technology implementation is not free, however, it requires investment in human capital and R&D (Redding, 1996) by the host country. If the host country does not have the domestic capability to absorb the spillovers of foreign technology then the diffusion will not progress (Abramovitz, 1979).

Theorists have illustrated the concept of organizational learning in many different ways. Huber (1991) theorized organizational learning in terms of processes and subprocesses. For example, in Huber’s construct for Knowledge Acquisition, he shows how knowledge can be obtained by experiential learning, and experiential learning can be in the form of organizational experiments. An experimenting organization learns about variety of methods, like the videoconference, to solve problems and in the process acquires new knowledge. According to Huber, before organizational learning can occur knowledge must be acquired, distributed in the form of information, interpreted and then retained in some form of organizational memory.

The current study investigates the role of community-based organizations in Ethiopia for a videoconference training that encompasses many components: individuals, groups, organizations, and countries. It would be difficult to understand the role of community-based organizations without investigating the cultural effect that the global communities of practice have on the group and the individuals’ social interaction within the group. It is therefore necessary to look at the social settings and cultural and technological barriers.

“Achieving high levels of organizational performance requires the integrated development of information technology, team structures, and the overall organizational context” (Mankin and Cohen et al., 1996, p. 10). The term technology includes information and communication systems and tools used by individuals and teams in their work (Mankin and Cohen et al., 1996). In the current study technologies including videoconferencing, forums, and email were used for group discussions.

Training can be categorized as formal classroom training, on-the-job training, or self-taught training (Sherman, 1993) with mentoring relationships (Sacks, 1994). In the current study the trainees participated in classroom type training where occupational skills training are offered to participants. On the other hand, learning for the trainers was on-the-job training. The coordinator (leader) learned in a hybrid mode that included on-the-job training and self-taught training.

RESEARCH METHODOLOGY

To investigate the impact of training and technology diffusion in countries with developing economies a long-term assessment is necessary (Ruth, 2000). The complete study spans three years and utilizes both quantitative and qualitative research methodologies. The longitudinal study is planned to include six videoconference training programs, 10-12 hours of training for each training program, and 15-30 training participants in each training program that will participate in a train-the-trainer model. The subjects of the training are skilled professionals in health, education, and agriculture. The training programs are planned for completion within twelve months. Two surveys, a survey at the beginning and end of each training program, and two interviews, an interview after six months and two years from the end of the training program, will be conducted to understand the impact of the videoconference training.

For quantitative research the rigorous Kirkpatrick (1994) four levels of evaluation with four questions (Philips, 1991) are selected:

- Reaction Level: Were the participants pleased with the program?
- Learning Level: What did the participants learn in the program?
- Behavior Level: Did the participants change their behavior based on what was learned?
- Results Level: Did the change in behavior positively affect the organization?

Reaction level is a satisfaction survey; validated instruments from previous studies will be taken for the reaction level survey. Learning level includes a pre- and post-test that will be conducted at the beginning and end of each training program. The same questionnaire will be used for both. As suggested by the Kirkpatrick model behavior level and results level will be conducted six months and two years after the end of the training, respectively.

Action research methodology is used for qualitative analysis. "One of the underlying beliefs informing qualitative methodology is that theory should flow from the data rather than providing a hypothesis for confirmation or disconfirmation" (Sacks, 1994, p. 16). Action research purports significant job involvement by researchers and proposes that anyone who seeks to understand learning within an organization must become rooted in the organization and must come to know it as its members know it (Sacks, 1994).

For action research the design was setup in a logical sequence that connects the empirical data to the initial research questions and to the conclusion following Yin's (1994) basic steps that include research questions, unit of analysis, logical linking of data to preposition and discussion, and finally the criteria for interpreting the findings. In the current study the action research is exploratory with the aim of developing propositions that can be molded into a theory on communities of practices.

Unit of Analysis

The primary distinction in designing case studies is between single- and multiple-case design (Yin, 1994). The current study looks at one case study, the videoconference training, and has several units of analysis including country, communities of practice, groups, and the individuals in the groups. Therefore it is a Type 2 case study design, single-case design with multiple units of analysis.

Action Research as a Case Study Methodology

A case study is an empirical inquiry that investigates a phenomenon within its real-life context, especially when the boundaries between the phenomenon and context are not clearly evident (Yin, 1994). While case studies are mostly interested in what has happened in the organization, action research aims to resolve problems (Lambright, 2001). Action research is a research methodology that aims at producing new knowledge that contributes practical solutions to immediate problems and to general knowledge (Elden and Chisholm, 1993). Action research lends itself ideally to aspects of planning, analysis, design, and implementing information systems within the organizational setting (McKay and Marshall, 1999). Like information systems action research is an iterative process involving researchers and practitioners who intervene when necessary, and reflect on what was learned (Avison, et al., 1999). Therefore action research is considered an appropriate methodology for the current study. Unlike other research methods, action research rests in an interpretive philosophical framework (Susman and Evered 1978), and embodies a process that closes the gap between researchers and practitioners. Oftentimes, practitioners complain about the lack of relevance of published research for the problems they face and about the lack of responsiveness of researchers to meeting their needs (Susman and Evered 1978).

Action research, through collaboration, aims to contribute to research and to the practical concerns of people in problematic situations (Rapoport, 1970) and develops self-help competencies for people facing problems (Susman and Evered, 1978). Greenwood and Levin (2000) argued that action research creates valid knowledge, theoretical development, and social improvements that the conventional sciences have promised to achieve in the research community. Criteria for quality and rigor for action research have been proposed by Baskerville and Wood-Harper (1998) and Stringer (1999). Appendix A shows validity criteria for action research in information systems domain.

The Role of the Investigator

Ongoing usefulness of electronic media needs the intervention of technology-use mediation by organizational actors (Orlikowski, Yates, Okamura, and Fujimoto, 1995). Users' initial and ongoing use of the videoconferencing was significantly shaped by the actors, coordinators of the videoconference. The interaction between technology and organization is described by a structural model of technology, structuration theory (Orlikowski, 1992). The author was the coordinator of the videoconference training program and had responsibility to ensure that the training program was managed properly to meet the desired goal.

The author made management decisions to assure the project stayed on schedule, and at the same time made sure opportunities were provided for group learning. Being the manager and the researcher of the development effort, the author was able to perceive reality from the viewpoint of the members "inside" the case study rather than external to it. This setting of action research methodology provided an accurate portrayal of the training program (Yin, 1994).

The action research documents the lessons learned from a two-way global videoconferencing, addressing the first research question in the current study. In addition, the action research will develop practices for favorable video-based trainings. The process for the action research and data collection will follow the steps outlined by Baskerville and Wood-Harper (1998) and Stringer (1999), Appendix A.

DATA ANALYSIS

This research in progress is based on the first nine months effort (July, 2003-March, 2004) in developing the global videoconferencing technology; pilot tests with eight videoconference centers; a 12 hours completed training program; and dialogues and informal interviews with participants.

During the development phase mediation activities (establishment, reinforcement, adjustment, episodic change) identified by Orlikowski, et al., (1995) in a metastructuring process were present. Observation from the mediation activities was used as the data source for the development phase. Observation during the pilot tests and the training program; dialogue and informal interview with participants provided a data source to draw from. The data analysis will be further strengthened as the survey results are collected and analyzed in subsequent studies.

DISCUSSION

The current study is a research in progress. Additional findings and a full discussion of the research questions will be presented at the end of the training program. In this section we discuss lessons learned in four areas: train-the-trainer model for countries with developing economies, infrastructure challenges in countries with developing economies, cultural barriers, and the role of community-based organizations.

Training a large number of people is time consuming and costly. The videoconference training in the current study is setup as a train-the-trainer model. This model allowed the community-based organizations to focus the limited resources on training twenty-one senior physicians. Facilitation of new knowledge depends on sufficient level of human capital in countries with developing economies (Nelson and Phelps, 1966). The twenty-one senior physicians will train other physicians quickly increasing the number of trained experts in the host country. Human capital plays a critical role in building capacity especially in countries with developing economies (Lee, 2001). Train-the-trainer model leverages expert resources in the U.S. by utilizing their time for training senior physicians. It also reduces the cost of future training as repeat trainings are done locally. Utilization of the global videoconference setup can be maximized by focusing its use for new training programs and moving repeat trainings to the host country. The adoption of computer technology has been shown to be associated with higher level of human capital (Caselli and Coleman, 2001).

The videoconference training program was augmented by online forum discussions and email technologies. However, for the Ethiopian trainees the extent of forums and email use was limited by the lack of widespread access to Internet technologies. The paucity of Internet infrastructure in countries with developing economies limits technology diffusion (Goodman, et al., 1998). Current Internet use in East Africa, Ethiopia and neighboring countries included, amounts to 8.2 users per thousand

population; in contrast, the U.S. has 492.6 users per thousand population (Computer Industry Almanac, 2000). Widespread Internet access may be a prerequisite for a distance learning program like the current study.

The current videoconference training setup had a gateway at Kennesaw State University which connected four video sites and twenty audio sites. This setup required access to a compatible videoconferencing equipment to participate in the program. This often means installing videoconferencing equipment or paying for videoconferencing services from a vendor. Both of these options incur significant cost. The high cost of videoconferencing may be an inhibiting factor for widespread implementation. Technology developments in low-cost videoconferencing may provide solutions (Knontzer, 2003).

The current videoconference setup used an Internet Protocol (IP) connection. This has significantly reduced the cost of communication (Knontzer, 2003). However, it relies on having a broadband connection. In a developing country like Ethiopia Internet infrastructure, not to mention broadband, access is at its infancy. Fortunately, Ethiopia was one of World Bank's Global Distance Learning Network sites that created a satellite link for videoconferencing. However, this requires every training participant to be physically present at the one location. When participants are unable to travel to the designated site they are forced to miss the training.

In addition to the technical challenges with videoconferencing, the training program has to deal with challenges of metaphor, meaning, culture, roles, time, awareness, and collaboration (Kimball, 2001). Time differences between U.S. and Ethiopia created a significant challenge for scheduling training. Experts in the U.S. from California, Georgia, Maryland, Michigan, Minnesota, New York, and Washington DC participated in the videoconference training. Participants in Ethiopia wanted the training to be scheduled during the early afternoons. Time difference between Ethiopia and the U.S. locations ranged from 8-11 hours. For example, 2:00 PM in Ethiopia is 6:00 AM Eastern Standard Time (EST) and 3:00 AM Pacific Standard Time (PST). This time difference created challenges in coordinating the different locations. Final schedule for the two-hour training was agreed for 4:00 PM Ethiopian time, 8:00 AM EST, and 5:00 AM PST. Occasionally, as it has happened twice during the six weeks training, time for additional discussion is needed which requires special arrangements. The time difference limits scheduling options to only a few hours each day. When scheduling conflicts arise they are often difficult to resolve. In one instance one of the locations in the U.S. had to cancel due to scheduling conflict. Another time, the entire program had to be moved to a weekend.

Setting up the videoconference equipment requires some level of technical acumen. Therefore, each videoconferencing session required scheduling of technical staff. While the training starts at 8:00 AM EST, for example, the technician often has to be present one hour in advance to setup the equipment. Scheduling and coordinating technical staff was a challenge. This became even more challenging when sessions had to be moved to the weekends as overtime and double overtime issues have to be considered. As the training progressed, it was necessary to train the presenters and the physicians on the technical setup and operation of the videoconference facility. The technical training for the physicians is progressing with some level of success.

Seemingly simple things like addressing a person during dialogue can create confusion: In the U.S. culture, a person is addressed formally by his/her last name and in Ethiopia a person is formally addressed by his/her first name. The concept of last name or surname in Ethiopia is different from that of the U.S. During discussions a U.S. colleague would address an Ethiopian counterpart by his/her last name. Another person in Ethiopia would address the same person by his/her first name. This created confusion in some of the discussions, especially when one person's last name is the same as another person's first name, which is common in Ethiopia.

The role of community-based organizations was observed to be critical in two areas: cost and collaboration.

Cost: All of the trainees in the current study are medical doctors and all of the presenters and coordinators hold a Ph.D. or M.D. Were presenters and coordinators paid this training may not have been feasible. The goodwill focus of community-based organizations was the main factor that offset the cost and made this training a reality. Every other American adult, 90 million people all told, works at least three hours a week volunteering through community-based organizations (Drucker, 2001). The type of jobs these volunteers are doing is shifting to professional and managerial tasks (Drucker, 2001). Drucker (2001) calls the increasing number of professionals serving in community-based organization as "the most important development in American society" (p. 49). The proportion of the volunteer work is equivalent to 10 million full-time jobs. Even at minimum wage this amounts to \$150 billion dollars a year, or 5 percent of GNP (Drucker, 2001). Considering the cost inhibitors in countries with developing economies (Lee, 2001; Nelson and Phelps, 1966) this level of volunteering may not have been possible had it not been for the role of the community-based organizations.

Collaborations: The videoconference training in the current study has involved individuals from more than ten organizations. Many of these individuals come from different disciplines. Creating this level of synergy may not be possible without the auspices of a community-based organizations. Community-based organizations are forming new bonds of communities

(Drucker, 2001). The inherent view of goodwill in community-based organizations gives individuals a different form of compensation, gratification in service, and making a difference. Individuals and organizations are drawn by the desire to volunteer for community, for commitment, for contribution, and the need to do something where one can make a difference (Drucker, 1992, 2001; Warren, 2002). This brings a new level of motivation and productivity of knowledge workers (Drucker, 2001).

The preliminary findings indicate some enablers of success and practice for favorable outcome including: role of charitable organizations (cost and collaboration), support for interdisciplinary endeavor, and mediating activities. A systematic thinking about technology use mediation includes establishment, reinforcement, adjustment, and episodic change (Orlikowski, et al., 1995). Our preliminary finding supports these mediating activities. Further analysis will be done as the study continues.

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APPENDIX A: VALIDITY CRITERIA IN INFORMATION SYSTEMS ACTION RESEARCH

The criteria and description is given in Figure 1.

	Criterion	Description
1.	Research should be set in a multivariate social situation	The relationships between people, events, and things are a function of the situation as relevant actors currently define it. These relationships are not free of their context, but change as the definition of the situation changes (Susman and D.Evered 1978).
2.	Observations are recorded and analyzed in an interpretive frame	Extensive field notes and fieldwork experience are used to provide concrete illustration and examples. Portray real people doing and saying real things, seen through the eyes of the researcher (Wolcott 1990).
3.	Researcher action intervenes in the research setting	Interdependence between researcher and the client system is an essential feature of action research (Susman and D.Evered 1978).
4.	Method of data collection includes participatory observation	Researchers should record their observations in field notes that provide records of important elements of each of the settings. Notes can include: places, people, objects, acts, activities, events, purpose, time and feelings (Stringer 1999).
5.	Changes in the social setting are studied	As the state of the social setting changes the results must be analyzed. In other words, the reader must have enough information about the exact social setting in which the stimulus-response was observed such that the stimulus may be revised or adjusted in order to make sense (Susman and D.Evered 1978).
6.	The immediate problem in the social setting is resolved during the research (internal validity)	Unlike other forms of qualitative research, action research is primarily validated by its relief of the immediate social problem setting. Action research is a goal-directed field research methodology, and its goal achievement is central to the actions directed toward achieving the goal (Baskerville and Wood-Harper 1998).
7.	The research should illuminate a theoretical framework that explains how the action led to the favorable outcome (external validity)	Action research contributes to the development of theory by taking actions guided by theory and evaluating their consequences of the problem members face. Theory may then be supported or revised on the basis of the evaluation (Susman and D.Evered 1978).

Figure 1. Action Research Validity Criteria for Information Systems