Primary and Secondary Impacts of Applying eLearning Technologies in a Developing Country

Theresa Pesi Murphrey
Visiting Assistant Professor
Department of Agricultural Education
Texas A&M University
229 Scoates Hall
College Station, Texas 77843-2116 USA
Telephone: (979) 458-2749
Fax: (979) 458-2698
t-murphrey@tamu.edu

Abstract

This paper seeks to describe the environment and process by which an educational CD was developed by two international agencies and to share primary and secondary impacts resulting from the development process. Research questions developed to guide the study included, “Did individuals involved believe they benefited from the eLearning development experience and, if so, how were they impacted?” and “What lessons learned can be shared and transferred to others interested in using technology to facilitate learning?”. Qualitative research methods were used to guide the study.

Lessons learned include an awareness of the instructional design process, the importance of interactivity, and logical order of content. The skill-set obtained during the process of developing the CD has empowered the participants to advance in the area of eLearning and serve as an example to others within their organization and beyond. One participant stated, “We learned that we could do more than just provide information.” This project continues to serve as an example of using technology effectively and has served as a foundation for similar projects in Peru.

While the goal of this project was to create a CD, an added outcome of the project was the empowerment of the individuals involved and the awareness generated within participants. The “indirect training” the participants received through their involvement in the project was retained because the subject matter was a “fit” with their work environment. The purpose of this study is not to generalize but to share one case that can be looked to for example and possible justification for similar endeavors.
Introduction

A partnership was formed between Texas A&M University (TAMU) and the Inter-American Institute for Cooperation on Agriculture (IICA), in Costa Rica, to use eLearning technology to disseminate technical content and training. The purpose of the partnership was to improve access to information, expertise, and training opportunities between the United States and Latin America. A development team was formed to create educational content for use in training. A model unit of instruction was created by the development team to demonstrate and utilize the current concepts and methods of sustainable development being implemented, titled *Windows of Sustainability*. Financial support for the development of this module was provided by the Inter-American Institute for Cooperation on Agriculture (IICA) and the German Technical Cooperation (GTZ) to: 1) determine the feasibility of using eLearning to deliver technical agricultural content and 2) to demonstrate the technological tools and methods available for creating eLearning. The development process took place over a twenty-two month time period in which experts from Texas A&M worked with individuals in Costa Rica to develop the educational content. In previous years, the content specialist for this particular topic had traveled to multiple locations within Costa Rica and to other Central American countries to present “sustainable development” workshops. Creation of a CD was seen as a means to reduce trainer travel, reach an expanded audience, and enhance the learning experience. This paper seeks to describe the environment and process by which the CD was developed and share the primary and secondary impacts resulting from the development process.

Background

Measuring the impact of any particular project often meets many challenges; in fact, Phillips and Edwards (2000) reported that impact assessment is not something to be documented but rather a story to be told as it is a reflection of those assessing and those being assessed. Development projects often involve a training component either directly or indirectly in one way or another even when the focus of the project is not training. Training increases human capacity and thus the ability of individuals to effectively engage in the particular project while also becoming a more productive member of the society in which they participate.

Pritchett (2001) reveals that the impact of education often falls short across countries because either the educational capital actually lowers economic growth, current education continues to fall more rapidly than the supply of education, or the education is so low to begin with that the education creates no human capital. Given these possible shortcomings of formal education, it is important to consider the learning environment and possible benefits of education received indirectly due to projects such as the development of a CD. Education received indirectly can be more effective than traditional education based on a study entitled “Person-Environment Fit and Transfer of Training” (Awoniyi, Griego, & Morgan, 2002) that revealed the importance of the environment to the transfer of learning to the work place. Lim and Johnson (2002) further maintain the importance of a supportive work environment to effective training. Given that this project involved training in order to
accomplish the project, it is possible that the “supportive environment” and “fit” felt by those involved enhanced the retention of understanding regarding instructional design and CD development.

**Purpose**

The purpose of this study was to describe the environment and development process undertaken and to identify lessons learned from the perspective of the participants from the international agricultural agency. Research questions developed to guide the study included, “Did individuals involved believe they benefited from the eLearning development experience and, if so, how were they impacted?” and “What lessons learned can be shared and transferred to others interested in using technology to facilitate learning?”.

**Methods**

Qualitative research methods were used to guide the study. The study seeks to describe the construct of the CD development from the perspective of those intimately involved in the development process. The phenomenon is intrinsically bound by the four people individually involved in the design and development of the CD. Data collection was accomplished by interviewing four individuals involved in development, and reflecting on notes and documents created throughout the development process. The combination of interviewing and document analysis allowed the researcher to validate and cross-check findings (Patton, 1990). Data analysis occurred simultaneously with data collection. Data was examined to determine constructs, themes, and patterns. As similar categories emerged, these were further defined. Reflective analysis was employed to attempt to depict and conceptualize the meaning conveyed by those interviewed.

**Findings and Conclusions**

**CD Development**

The development of the CD took place over a twenty-two month time period. During this time, the content expert traveled to Texas A&M University to engage in intensive dialogue with the instructional designer over a four-day period. The content was reviewed, fundamental instructional design was shared, examples of content presentation and interactive strategies were presented, and brainstorming sessions were held to develop the initial approach for instruction. This initial face-to-face work session facilitated a friendly work environment and enabled relationships to develop that would be maintained at a distance and enable quality communication.

Following the face-to-face meeting, interaction continued through the use of e-mail, video-conferencing, FTP (File Transfer Protocol), and traditional mail. Materials were written in English and then translated by an IICA staff member into Spanish. These materials were then checked for accuracy by a translator. Six months following the initial meeting, the instructional designer traveled to Costa Rica to finalize instructional design adjustments and obtain necessary media. During the following summer, a professional
speaker was hired to record portions of the instruction. This was done to allow the inclusion of both male and female voices and avoid gender bias. This audio was recorded at IICA in Costa Rica and mailed on tape to Texas A&M University where the audio was incorporated into the instruction. Final steps of the development process included a comprehensive review of the CD subject matter from both content and programming perspectives, the design of the CD cover, and duplication of the CDs. The final product was presented at the Expo 2000 in Germany. The actual development of the CD took place over the first twelve months of the twenty-two month time period. The final ten months involved finalizing, duplicating, and distributing the CDs. The delay during this time was due to team member obligations to other projects. The entire development process consisted of creating, verifying, editing, and translating content; photo selection; cover design; picture collection; and conceptual and technical work.

**Primary Impacts**

The primary goal of the project was to develop an educational CD on the topic of sustainability and use this medium to reach out to audiences served by the institutions. The attainment of this goal required extensive interaction between institutions. The following summary is a reflection of information obtained from interviews with four individuals directly involved in the project.

The main goal of the eLearning project, to develop a CD focused on the topic “Windows of Sustainability,” was successfully achieved. The objective was to show technologists in the field how to accomplish sustainable practices by using a “window” approach. It is believed that the CD met that objective by illustrating best practices and successful projects completed by the GTZ-lead project. The content of the CD is such that it continues to be accurate and up-to-date minus the inclusion of results of projects that had not concluded at the time of CD production.

Technical assistants as well as university professors have used the CD as both stand-alone instruction and as supplemental material for multiple workshops (both traditional and using video conferencing), often in combination with other topics. For example, in delivering training on “Impact Assessment and Economic Evaluation” the “Windows of Sustainability” CD is made available as supplemental training for farmers. Several organizations have integrated concepts learned from the CD into other training programs such as “Impact Assessment.” In addition, the CD has been demonstrated in Nepal, the Philippines, Ecuador, and Peru in areas where people work on rural environmental projects and use of the CD has increased demand for written IICA/GTZ publications focused on sustainability from various individuals and institutions.

Feedback regarding the use and application of the CD reveal that utilization of the CD has encouraged the use of sustainable practices, provided an informative and engaging resource to individuals and agencies involved in promoting sustainable practices, and stimulated strategies for implementing sustainable practices. Comments received from those who have used the CD reveal that the CD was easy to use and provided useful information.
Limitations regarding the use of the CD cannot be overlooked. It is important to remember that we must arm trainers/educators with not only quality eLearning materials but also the technical means (i.e., computers, projectors, etc.) to deliver these materials. During the interviews, it was shared that “without a projector you cannot show the CD to a large group.” However, it was noted that even given this limitation, the CD provided instruction in a quality and interactive manner that resulted in a beneficial delivery method.

Secondary Impacts

Development of the CD required extensive interaction, in a dual-country environment, between individuals located at both institutions. This interaction resulted in secondary impacts including the acquisition of new skills and knowledge that further resulted in empowering those involved in the project. The following summary describes the secondary impacts exposed in the analysis of the information obtained in interviews with the four individuals directly involved in the project.

The participants from the international agency came to the table with a “traditional” understanding of instruction, and no experience in developing eLearning. When asked, “What recommendations would you have for others seeking to develop an eLearning CD?” they noted some interesting points for consideration. While each described what they had learned in their own words, the lessons learned were similar across all four individuals. They noted that the process of creating the CD had helped them recognize the difference between delivering information (written materials) and creating instruction (learning). They also spoke at length about how they had learned to develop CD-ROM interactivities that can enhance learning. Many of the points focused on the importance of instructional design and project management, as noted below:

Instructional Design
- being precise and clearly stating ideas to encourage understanding
- using pictures, video, and activities instead of linear information
- including learning activities
- including a summary at the end of each unit
- including buttons to allow quick access to areas within the CD so that it can be used in different ways

Project Management
- dedicated time for the project
- having a clear goal of what you want to accomplish
- importance of both human resources as well as physical equipment
- good communication between the content expert and designers.

When asked, “What did you find to be most difficult during the project?”, all four indicated that “deciding what information to include” and “thinking of learning activities” were the most difficult because they required a lot of thought and planning. In fact, one person stated, “In the beginning, we did not even know what a CD was, what information was needed, or how to plan an interactive activity -- basically we did not know where to start.” However, after the completion of the project, one staff member revealed how she
quickly moved from novice to expert and was asked by another division in her organization to serve as a consultant to them as they embarked on the development of a CD.

Summary

Evaluation and synthesis of responses shared in the interviews reveal important lessons learned and impacts resulting from the development process. Lessons learned include an awareness of the instructional design process, the importance of interactivity, and logical order of content. The skill-set obtained during the process of developing the CD has empowered the participants to advance in the area of eLearning and serve as an example to others. In addition, the relationships developed during the process were an integral component that enabled successful creation of the CD. Each participant has gone on to use the knowledge they gained during the project in other eLearning activities. This newly-acquired knowledge helped one individual obtain a higher position in another international agency. During her interview with this agency, she used the CD as an example of what she could do. Another member of the team has plans to work for FAO (Food and Agriculture Organization of the United Nations) and other private groups with the intent of using what she learned from this project. The remaining two individuals continue to be involved in the arena of eLearning through the delivery of courses using computer-based training, video-conferencing and other media.

Educational Importance

The educational importance of this study focuses on two areas: understanding of a development process for using eLearning technologies to design successfully and deliver instruction and identification of the primary and secondary impacts of the development process. Assessment of projects undertaken with international agencies is often limited to the assessment of the original goals of the project; however, discovering secondary impacts can provide valuable insight into actual results and benefits ensuing completion. This awareness provides insight to guide future projects.

The participants from the international agency came to the table with a “traditional” understanding of instruction. However, as revealed in the findings of this study, they lacked the complete understanding of the importance of instructional design as it relates to the use of technology. While the goal of this project was to create a CD, an important outcome of the project was the empowerment of the individuals involved and the awareness generated within participants. The “indirect training” the participants received through their involvement in the project was retained because the subject matter was a “fit” with their work environment. This project continues to serve as an example of using technology effectively and has served as a foundation for similar projects in Peru. The purpose of this study is not to generalize but to share one case that can be looked to for example and possible justification for similar endeavors.
References


