Strategies to Enhance International Agricultural and Extension Education:
A Problem-Based Approach to Instructional Design

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Abstract
The need for more people to understand how other cultures think is an integral part of education (American Council on Education, 1998); however, meeting this need requires innovative approaches. A study conducted by Redmann, Schupp, and Richardson (1998) found that workshops held to foster awareness of global agricultural environments had limited success. Technology is offering new ways to meet the need to prepare people to manage projects both domestically and internationally by providing access to multi-media for problem-based learning that can be an effective means to encourage retention and transfer of knowledge. Involvement in international agricultural development activities at a distance can be costly, time consuming, and can involve risks.

The purpose of this study was to evaluate a computer-based learning activity that focused on solving a management problem faced by an expatriate working in international agricultural development. The educational importance of this study focuses on two areas: need for training in international development and potential for educators to use the approach studied. This activity provides students the opportunity to test their knowledge and skills without actually leaving their home country. Evaluation and synthesis of the responses revealed that the predominant reaction to the activity was positive. Students indicated that they “liked researching through all the extra materials to find common threads” and “liked the voices and the pictures – it makes it so real.”
Introduction

A balance of domestic and international education content is required to prepare the global workforce (Acker, 1999); however, meeting this need requires innovative approaches. The need for more people to understand how other cultures think is an integral part of education (American Council on Education, 1997). Successful change requires the exchange of information and thus communication and relationship skills are important for change agents (Havelock, 1973). Providing individuals with the skills to serve as international change agents and development project directors requires an understanding of how to handle situations. Change agents require skills to assess needs and to develop and promote improved strategies and technologies. A study conducted by Redmann, Schupp, and Richardson (1998) revealed that workshops held to foster awareness of global agricultural environments had limited success. New techniques and approaches need to be developed to enhance learning and retention. The need for international education is not new; however, the tools available to enhance learning and retention are new. “Innovative approaches need to be developed or implemented for broadly internationalized graduate education” (Acker & Scanes, 2000, p. 50). New technologies are providing these innovative means to prepare people to manage projects both domestically and internationally by providing access to multimedia for problem-based learning that can be an effective means to encourage retention and transfer of knowledge. “One of the most powerful uses of multimedia is to immerse the user in a learning environment” (Boyle, 1997, p. 35).

“Students learn best by doing, writing, discussing, or taking action, because active learning situations provide opportunities for students to test out what they have learned and how thoroughly they understand it (Davis, 1993, p.181).” Problem-based learning can be an effective means to encourage retention and transfer of knowledge. International development work requires higher order thinking skills. Lewis and Smith (1993) offer a comprehensive definition: “Higher order thinking occurs when a person takes new information and information stored in memory and interrelates and/or rearranges and extends this information to achieve a purpose or find possible answers in perplexing situations” (p.136). Encouraging students to participate in higher order thinking can be challenging, however multi-media is providing new ways to achieve this goal. Herrington and Oliver (1999) found that multimedia programs that were based on a situated learning approach provided an environment where higher order thinking occurs.

Involvement in international agricultural development activities at a distance can be costly, time consuming, and can involve personal and financial risks. Activities that provide students the opportunity to obtain higher order thinking skills through a multi-media approach immersing them in a situation and asking them to evaluate the situation by interviewing appropriate individuals, reading appropriate materials, and reacting by presenting a solution, can effectively highlight specific skills and knowledge related to international development. While on-site practical training cannot be replaced, the approach studied can enhance and supplement programs of international education that attempt to prepare people to analyze and manage different kinds of problems that arise in development projects in the field.

Purpose

The purpose of this study was to evaluate a problem-based learning activity that focused on three management problems faced by an expatriate working in a cross cultural
international agricultural development. The specific objectives were as follows: 1) Determine if students perceived the activity to be helpful, enjoyable, and/or usable; 2) Determine if students had a preference for the audio or text portions of the activity; and 3) Identify ways to improve the activity. It was not the purpose to measure how much the students learned from the activity.

**Methods and Data Sources**

**Research Design**

Descriptive survey methodology was utilized. Data were collected using an assessment survey consisting of seven Likert-type, three multiple-choice, and six open-ended questions. The population of the study selected to test each of the three cases developed consisted of forty-eight students enrolled in graduate courses related to international development: “The Agricultural Advisor in Developing Nations,” “Institutions Serving Agriculture in Developing Nations,” “Initiating, Managing, and Monitoring Projects of International Agricultural Development,” and “The Transfer of Technology by Institutions.” Data were collected during three semesters (Summer 2001, Fall 2001, and Spring 2002) to allow all three cases to be evaluated. Interactive CD-ROMs containing the unit of instruction were distributed to all students in the course during a regularly scheduled class meeting. Use of the CD-ROM was explained and an instruction sheet was distributed. The following week students submitted written responses to each case and participated in a classroom discussion that included the real-life solution. The survey instrument was administered following the discussion. Descriptive statistics consisting of counts and percentages were used to describe the responses. In addition, written comments provided by the students were evaluated and categorized to provide insight as to how the activity could be improved.

**Development of Activity**

The learning activity entitled “International Agricultural Development Cases: What Cha Gonna Do!?” was developed with the purpose of generating awareness and understanding of complex situations that can arise managing projects in international development settings. The activity included three situations: one involved a problem of low morale and low productivity in a soil-testing laboratory, the second involved a “turf” war between two agencies as to who was to grow and distribute cacao seedlings to farmers, and the third involved a project manager being asked to provide information and advice to a minister of agriculture concerning an ill-considered directive from the president of the country to increase poultry production to help improve diets.

The three activities were designed and developed during the Spring 2001 semester by students enrolled in AGED 645, “Initiating, Managing, and Monitoring Projects of International Agricultural Development,” under the direction of the authors. Students were divided into three groups, assigned one situation per group, and given information about the situation. Each group worked together as a team to “bring-to-life” the real-life international development situation by:

- Evaluating/identifying problems, players, solutions, and key facts
- Scripting audio clips to depict the views/opinions of each of the players to be presented along with a written narrative
- Creating support documents (e.g., pictures, reports, newspaper articles, etc.)
After students drafted items to enliven the case, the authors discussed the cases with each group to facilitate understanding of the situation. The three learning units were then designed, created, and programmed by the authors and support personnel. Each unit’s format is as follows:

- A dilemma in international development is presented and information about the dilemma (i.e., audio interviews, pictures, diagrams, documents, etc.) is made available.
- The student is asked to review relevant information that has been made available and recommend a solution.
- The student then receives feedback during a classroom discussion as to ramifications of that solution as well as the solution that was actually implemented. Videotapes of those discussions were made also to be used in adapting each case to Web-based delivery in the future.

**Results and Conclusions**

Evaluation and synthesis of the responses revealed that the predominant reaction to the activity was positive. Students indicated that they “liked researching through all the extra materials to find common threads” and “liked the voices and the pictures – it makes it so real.”

Objective 1 was to determine if students perceived the activity to be helpful, enjoyable, and/or usable. No attempt was made to determine the learning style preferred by the 48 students. However, as revealed in Table 1, more than ninety percent of the students indicated that the activity was enjoyable and helped him/her to become aware of the different factors that one may have to consider while working in a cross-cultural setting. While 75% of the students indicated that they enjoyed the activity, no one indicated that they did not enjoy the activity. Several students indicated that the fact that the case really happened made the activity more enjoyable. The students listed the problem-based approach as something they liked most about the activity. One student commented, “Great way to learn about international development.” Based on the responses received, it was concluded that the activity was perceived by the students to be both fun and educational.

Objective 2 was to determine if students had a preference for either the audio or text portions of the activity. In relation to preference for audio and text, 46.8% found themselves reading, 42.6% found themselves both reading and listening, and 10.6% found themselves listening. Students commented that they liked the “pictures and voices” and one student stated “Having photos and audio augment experience of learning [was] more interesting than just a sheet of paper.” However, one student stated, “I didn’t like the audio interviews. I found it very distracting.” Based on the finding that 89.4% of the students listened to the information presented in an audio format, it was concluded that audio was an important part of the activity and should remain an integral instructional part of the activity. However, based on the comment related to dislike for audio, it can be concluded also that a way to turn off the audio should be made clear in the instructions.
Table 1


<table>
<thead>
<tr>
<th>Question</th>
<th>Response</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did the case presented help you to become aware of some of the different factors that one may have to consider while working in a cross-cultural setting?</td>
<td>Yes</td>
<td>45</td>
<td>93.8</td>
</tr>
<tr>
<td></td>
<td>Somewhat</td>
<td>3</td>
<td>6.2</td>
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<td></td>
<td>No</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Did you enjoy the activity?</td>
<td>Yes</td>
<td>36</td>
<td>75.0</td>
</tr>
<tr>
<td></td>
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<td></td>
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<td>0</td>
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<td>Was navigation of the screens intuitive?</td>
<td>Yes</td>
<td>42</td>
<td>87.5</td>
</tr>
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<td>Somewhat</td>
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<td>10.4</td>
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<td></td>
<td>No</td>
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<td>2.1</td>
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<tr>
<td>Were the pop-up windows confusing?</td>
<td>Yes</td>
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<td>4.2</td>
</tr>
<tr>
<td></td>
<td>Somewhat</td>
<td>6</td>
<td>12.5</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>40</td>
<td>83.3</td>
</tr>
<tr>
<td>Were the directions clear?</td>
<td>Yes</td>
<td>40</td>
<td>83.3</td>
</tr>
<tr>
<td></td>
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<td>8</td>
<td>16.7</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Were the colors used easy for you to read on the screen?</td>
<td>Yes</td>
<td>45</td>
<td>93.8</td>
</tr>
<tr>
<td></td>
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<td>3</td>
<td>6.2</td>
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<tr>
<td></td>
<td>No</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Were the fonts used easy for you to read on the screen?</td>
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<td>43</td>
<td>89.6</td>
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<tr>
<td></td>
<td>Somewhat</td>
<td>4</td>
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<tr>
<td></td>
<td>No</td>
<td>1</td>
<td>2.1</td>
</tr>
</tbody>
</table>

Objective 3 was to identify ways to improve the activity. While there were a few comments in regard to technical difficulties in using the activity, the majority (39 out of 48 students) indicated that they did not experience problems and thus it was concluded that the activity was technically sound. Feedback provided by the students in regard to how to improve the activity centered on “wanting more information.” Comments included “Provide more details on the farming/agriculture of the country,” “Give a little more background on the agencies and the situation in general,” and “Be more specific with locations and what people are from where.”

The purpose of the activity is to encourage critical thinking and practice in effective problem solving and thus the students should not be provided information that would distract from that purpose. However, based on student comments, it was concluded that additional
information would assist the students in understanding the case. Specifically, the role that the student serves in analyzing each case or the roles of different people involved in the situations portrayed should be further explained and defined. For example, the meaning of “counterpart” should be defined. In regard to the interviews, it can be concluded that a profile of each person interviewed would assist the students in understanding the context in which the person was responding.

**Educational Importance**

The educational importance of this study focuses on two areas: 1) the need for providing training in representative problems faced in managing projects of international development and 2) the potential for educators to use the approach developed and studied. The investigators are actively involved in using technology to enhance learning both in the traditional classroom and at a distance. The activity under study is the first in a series that will serve as foundation units in courses on managing international agricultural development projects and related topics. This activity provides students the opportunity to test their application of knowledge and skills in a realistic situation without actually leaving their home country. While developed as self-contained CD-ROMs, these types of units may also be adapted to Web-based delivery in asynchronous settings.

Additional importance relates to the findings surrounding the effectiveness of the approach. Given that students found the activity to be enjoyable, realistic, and interesting, other educators may be able to use similar approaches for their instruction. On-site practical training cannot be replaced. However, the approach studied can enhance and supplement programs of international education preparing people to work in the field, especially in cross-cultural settings in which they may find themselves to be managing projects or providing advice as expatriates.

**References**


