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International Study Abroad Experiences with Agents and Students: A Case Study in Belize

Abstract

The internationalization of local Extension programs has long been a source of debate among Extension educators. Often, international work is seen as extravagant during difficult economic times. Extension also faces challenges attracting qualified young people into our profession. We report the results of a combined international Extension training and student education program. This program was popular with agents and students, improved student knowledge of Extension, and made long-term contributions to the programs of agents who participated. Building the cost for agent participation into study abroad courses may benefit students, Extension agents, and teaching faculty while controlling cost to Extension programs.

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Background

Nearly three decades ago Patton (1984) wrote about the need for greater emphasis on international Extension. A dozen years later Ludwig (1996) stated:

Extension Educators have the responsibility to help clientele develop a better understanding of the complexity of global issues. Issues that might be targeted include human health, the environment, diversity, renewable resources and the agricultural market...helping traditional rural and agricultural clientele to recognize the need for education on international issues.

In this second decade of the 21st century, Extension still struggles with how to capitalize on the value of international experiences. Harder, Lamm, & Vergott, (2010) found from a survey of field-based Extension agents that even though most were interested in expanding their training with an

international experience, barriers such as financial cost, time commitment, and work obligations restricted these opportunities.

At the same time Extension struggles with internationalization, it also faces the challenge of attracting qualified people into the profession. With close to 80% of our population now living in non-rural areas, traditional career paths toward Extension have dwindled. Rogers, Mason, & Cornelius (2001) stated that "Undergraduate students represent a potential valuable pool of human resources who can extend the ability of agents to provide education at a time when resources are limited." The success of the Extension Intern program speaks to the benefit of involving undergraduates in hands-on learning about real-world problems with Extension agents (Rogers, Mason, & Cornelius 2001). New opportunities to bring students and agents together could help to bring more young people into Extension.

International education benefits both Extension agents and undergraduates (McCabe, 2001) and may serve to link the two groups. Observing approaches used by other cultures can provide insights and offer new technologies and strategies. This may improve the ability of Extension agents to meet the natural resource concerns of landowners and increase their effectiveness in interdisciplinary environments (Vincenti, 2001). In addition, international education exposes undergraduates to new concepts and technologies, and students who have international experiences show improved critical thinking and communication skills (Knight, Elliot, & Krenzer, 2000; Vincenti, 2001). In recognition of this benefit, institutions of higher education often focus on integrating international perspectives into teaching, research, and outreach (Knight, 1997; McCabe, 2001; Taylor, 2004). International training programs such as the one we describe here allow Extension agents and students to interact and learn together.

Virginia Tech has an established network in Belize that served as the foundation for the combined Extension and student program described here. Belize is a country rich in natural resources, with more than 60% forest cover (Cherrington et al., 2010) and a rapidly expanding population. As a result, the country faces issues related to sustainable development, natural resources, and profitability of farm and forest operations that are familiar to Extension in this country.

Objectives

The two major objectives were to develop a training program for Extension agents that would enhance their capabilities and provide for knowledge transfer back to constituents in the United States and to pair this Extension agent training with an undergraduate course focusing on agriculture and natural resource issues.

This article reports on the results of the program, which began in 2008 and concluded in 2011. We describe the recruitment efforts and then focus on three core issues:

1. Agriculture and natural resource elements relevant to the Extension mission
2. Extension agent perception of program effectiveness
3. Student learning about Extension concepts

Methods

Program Recruitment

The 2-week program was offered in mid-May, after the academic year. We taught the combined agent-student course a total of three times. This involved seven faculty (including three with partial Extension appointments), six Virginia Cooperative Extension agents, and 39 students.

Agents were recruited by announcing the opportunity via listserves and at in-service trainings. Agents were asked to submit an application explaining their interest, a recent faculty report, and a letter of support from their supervisor. Four agents applied in 2009 for two slots, and the choice of agents was based on the strength of the linkage between the agent's program and the course. In both 2010 and 2011, only two applications were received. This experience was official work time for the agents; in addition, their airfare, lodging, and most meals were covered through course and grant funds.

Students were recruited through study abroad fairs, campus emails, and fliers. Students were required to apply. The application involved a written component detailing their interest in the course elements (natural resources, agriculture, tropical biology, and Extension) and describing the anticipated benefit of the experience given their career interests. We also met with each student for an interview. Students accepted into the course received an \$800 scholarship that reduced the \$2,800 course fee to \$2,000.

Agriculture and Natural Resource Concepts and Venues

We identified three major concepts that served to focus course activities and site visits. These were (1) sustainable forestry, (2) non-timber forest product enterprises (including ecosystem services such as carbon storage), and (3) the management of pest species that also represent a challenge to U.S. agriculture and forestry. We chose these concepts because of their significance to Belize and their relevance to temperate agriculture and natural resources. This relevance to temperate Extension was an effort to increase knowledge transfer back to the United States, in keeping with the mission of the International Science and Education grant program (USDA NIFA).

Visits were coordinated with the Extension Division of the Belize Ministry of Agriculture and Fisheries. We also visited with private landowners, companies, and community-based organizations within the country such as the Community Baboon Sanctuary (Alexander, 2000). The specific venues varied slightly from year to year. Figure 1 shows the overview of the 2011 trip, but several were visited each year (Table 1).

Figure 1.

Approximate Path of the 2011 Belize Study Abroad Course, Created Using Periodic GPS Waypoints and with Significant Stops Numbered



Table 1.
Common Venues Visited Each Year

Location	Town or Village, District	Relevant Extension issues	Map location(s)
Community Baboon Sanctuary	Bermudian Landing, Belize District	Human-wildlife conflict, community based organizations.	2
Central Farm	Central Farm, Cayo District	Extension research and outreach, non-timber forest products (xaté, small fruit production), management of Africanized honey bee.	7
Bull Run Overseas, Ltd.	Mountain Pine Ridge, Cayo District	Sustainable pine forestry, maximum sustainable yield, fires as a forest management tool, management of southern pine beetle, ecosystem services (carbon markets and REDD).	10

Las Cuevas Research Station	Chiquibul Forest Reserve, Cayo District	Sustainable tropical forestry, reduced impact logging, non-timber forest products (e.g., xaté, edible wild plants).	14
Caye Caulker, including Caye Caulker Marine Reserve	Caye Caulker, Belize District	Sustainable fisheries, protected marine areas, producer cooperatives.	18 - 20

Sustainable Forestry—Reduced Impact Logging

Sustainable forest management and reduced impact logging were a focus of the course because of the important role forestry plays in the economies of the United States and Belize. Despite this importance, the basic tenants of sustainable forestry are in general poorly understood. Observing on-the-ground examples of reduced impact logging (Putz, Sist, Fredericksen, & Dykstra, 2008) and management for maximum sustainable yield allowed for first-hand discussion of the challenges of balancing the economic, ecological and social aspects of forest sustainability. The opportunity for agents and students to consider these components in a new context brought a renewed appreciation of the complexity and importance of sustainable forestry.

Nontimber Resources—Ecosystem Services, Forest Products

This broad category focused on non-timber income from forestlands. The emerging role of marketing ecosystem services (such as carbon sequestration through Reducing Emissions due to Deforestation and Degradation, or REDD) provides an opportunity for landowners to monetarily benefit from services their forests provide for society. Financial systems, resource professionals, and landowners are wrestling with the complexity of documenting, managing, and selling these services (Danielsen et al., 2011). Agents and students were able to work side-by-side to establish the baseline a REDD project requires and to meet with landowners and scientists involved in an active REDD project. The Bull Run Overseas REDD project (Map location 10, Figure 1) is described at <http://www.climate-standards.org/2011/01/24/bull-run-overseas-project/>. This experience clarified the sometimes-intangible issue of ecosystem service banking. Additionally, agents and students discovered many similarities between the cultivation, marketing, and protection of valuable non-timber forest products such as xaté (*Chamaedorea* spp.) in Belize (Bridgewater et al., 2006) and wild herbs such as ginseng and goldenseal in Appalachia.

Pest Management—Africanized Honeybees (AHB) and Southern Pine Beetle

Agents and students were able to meet with private landowners and professionals and see how these "pest" species were managed in Belize. AHB (*Apis mellifera scutellata*) are commonly found in much of the southern United States, and alternatives to eradication may be critical as the range of AHB expands and struggles with colony collapse continue (Pettis & Delaplane, 2010). Agents and students were able to speak with apiculturists regarding their successes managing AHB, and some participated in field assessments of pathogen incidence in AHB hives (Rangel, Traver, Stevens, Howe, & Fell, 2013). In the case of southern pine beetle, we saw how this endemic pest is managed through a combination of fire, uneven-aged management, and thinning. This was relevant to forest management in regions contending with *Dendroctonus* spp. As invasive species such as the emerald ash borer and gypsy moth continue to influence U.S. forestry, such lessons in successful adaptation are increasingly valuable and relevant.

Results

Assessment Framework

Agents and students were anonymously surveyed at the end of the course. Students received a survey that asked them to self-report their perceived knowledge gain during the course, and agents and students were asked to identify course strengths and areas that needed improvement. These responses were used to modify future course offerings. In addition to this end-of-course survey, we developed a Web survey in 2013 to solicit feedback from each of the six participating agents regarding their longer-term perceptions of the experience.

Extension Agent Training and Surveys

Extension agents' participation in this program benefited them professionally and also contributed to the student experience. The intentional linkage between concepts in Belize and parallel issues in the U.S. was designed to contribute to each agent's knowledge of issues within their own service areas. U.S. Extension agents were encouraged to talk with their Belizean counterparts, and in 2010 made formal presentations at a countrywide meeting of Belizean Extension. This led to a collaborative research effort in 2011 focused on assessment of *Apis nosema* and *A. ceranae* incidence in Belizean apiculture (Rangel et al., 2013).

An online survey was completed by each of the agents in July 2013, 4 years after the first group of agents completed the course and 2 years after the final group. Each of the agents who participated in the course completed the online survey (100% response rate), and all indicated their professional satisfaction with the experience (data not shown). There was general agreement that the experience was valuable and influential, and most felt the project was a good use of public funding (Table 2). While fewer strongly agreed that the experience could serve as an example of internationalization, it is possible that as we improved integration with Belize Extension the strength of this example increased over the 3-year period.

Table 2.

Results from July 2013 Agent Assessments. N = 6 Agent responses

Survey question:	Strongly agree	Agree	Disagree	Strongly disagree	No answer
The experience has influenced my work as an educator.	3	3			
The experience could serve as an example of the potential benefits of internationalization of Extension.	2	4			
I feel this project was a good use of my time.	5	1			
I feel this project was a good use of public funding.	4	1			1*
* Agent did not answer survey, but indicated neutrality in the "Please elaborate" section.					

One of the respondents indicated neutrality regarding the use of public funding for the effort; in the Conclusions section of this article we discuss a way to avoid direct use of public funds in future efforts. Another had a different perspective, and elaborated that "...this was a pretty small investment that will pay dividends the rest of my career. It's a perfect investment in a mid-career agent/educator."

One aspect of the course agents valued was the chance to interact daily with college-aged adults. Extension agents routinely work with school-aged youth and adults, but college-aged adults are a common missing link. An experience such as this one may help Extension agents anticipate the strengths and weaknesses brought by the next generation of clients and/or fellow professionals. One agent commented after the program that:

The interactions with the college students over a sustained period of time was a serendipitous professional improvement impact that has helped me have a better handle on who I'll be working with in the future. I didn't realize I had such a gap in my community snap-shot.

Student Extension Knowledge

Students experienced Extension throughout the course. Formal elements included in-class sessions prior to travel, agent presentations in country, and other in-country activities. For example, during a visit to the Central Farm (Map Location 7, Figure 1), Belizean Extension agents discussed the Extension mission as practiced in Belize and led trips to a range of outreach and research projects (e.g., variety trials, tree nurseries, experimental crop production, and apiculture).

Informal discussion of Extension was common and complimentary. In many cases, agents could directly compare concepts observed during the day to their own Extension experience. In other instances, students wished to talk about more personally relevant issues such as job opportunities, job satisfaction, and internships.

Student feedback on the inclusion of Extension activities in the course was positive; nearly all found the experience to be a valuable component. One student commented that

[t]he presence of Extension agents on the Belize E-term was very helpful. All specialized in their fields and were more than capable of answering any questions I asked regarding their field. They added their own quirks to the trip, which made it that much more fun and a memorable experience....

Another student stated

I think the agents were a good asset to the Belize trip. They were both very knowledgeable on different topics and they added to my learning experience. I learned new things from Mike when we did our entomology lecture and Adam taught me a lot I didn't know about the forest and its products.

Anonymous self-assessments of student knowledge of Extension were embedded within broader evaluations of the course. Students were asked to rank their pre- and post-course knowledge of the mission of Extension on a 0-10 scale, with 0 indicating "No Knowledge" and 10 indicating that a student believed themselves to be "Well Versed" in the topic. Those students who submitted self-assessments (35 of 39 students) reported significant knowledge gain. Self-reported answers to the question "How would you describe your knowledge of Extension *prior* to taking the course?" averaged 3.1/10, while answers to the question "How would you describe your knowledge of Extension *after* taking the course?" averaged 8.2/10. While these assessments suggest an increase in student knowledge about Extension, there are shortcomings to self-reported, post-hoc assessments. We recommend development of formal assessment approaches (e.g., pre- and post-tests of Extension knowledge) to address this concern.

Study abroad courses are often profound experiences for students, and this case was no different. Most of the students had never traveled abroad before, and many commented on the experience as having "opened their eyes" to biodiversity, international culture, and sustainability. The ability to experience a country rich in Mayan history and culture while also coming face-to-face with the challenges of a rapidly growing population brought the fragility of our shared society forward, and highlighted the need for shared solutions.

Conclusions and Future Applications

Over a 3 year period (2008-2011) six Extension agents, seven faculty, and nearly 40 students participated in this innovative program. Agents broadened their knowledge of natural resource and agricultural Extension and their world viewpoint of issues that impact Extension. Agents developed first-hand knowledge of key pest species that stand to greatly affect agriculture and forestry in the

United States (Africanized honey bee and southern pine beetle) and observed new strategies and technologies that can be used to increase income from timber and non-timber forest products. This knowledge will have important implications for agents' response to landowner requests for assistance, whether for insect pests or boosting farm income. Students were exposed to the many facets of Extension programs, with some indicating that Extension is now a potential career path.

The full cost of this experience was approximately \$2,500 per agent. One way to reduce this cost would be to link agents into existing study-abroad courses focused on natural resources. Teaching faculty may value the ability to include a working natural resource professional in the group of instructors. Further, many study abroad policies require one or more chaperones in addition to the course instructor for the sake of course safety. The cost of chaperones is typically built into the student fees for such courses; if the course was designed so that these "chaperones" were Extension personnel who could both learn and teach during the course, the only cost to Extension would be the out-of-office time.

This approach requires teaching faculty willing to develop meaningful learning experiences for agents, such as interactions with in-country agents, forestry personnel, or other resource professionals. Ideally, these in-country experiences would be designed in collaboration with Extension personnel. Interested agents wishing to develop such a program might pursue these connections either at R1 institutions or through smaller undergraduate institutions.

Finally, we were surprised by the low level of agent interest that we infer based on the small number of applications. The low interest may be due to the low perceived value of such an experience (by agents or supervisors); however, the assessment results from Extension personnel suggest that there is value to be had. Alternately, it may have to do with the difficulty of spending 2 weeks out of the office in May; if that is the case, it may be easier to recruit agents in courses taught during winter (e.g., "January Term" courses).

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