Assessing a Reciprocal International Student Travel Exchange: The Iowa State University and University of Costa Rica Intercambio

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SUMMARY. The creation and educational impact of a reciprocal travel exchange program for student groups in horticulture and allied sciences between Iowa State University (ISU) and the University of Costa Rica (UCR) are described. The program, called the “Intercambio,” (“exchange,” in English), has facilitated group travel for 10- to 12-day periods to farms and agricultural research centers in the host country annually since 1999. The article explores how the Intercambio began and factors that have helped to sustain it, to provide ideas for educators interested in initiating similar exchanges. Analysis of responses to a 2015 written survey of student participants indicated that the Intercambio has exerted a strong impact on academic studies and career choices for 77% of the ISU students and 100% of the UCR students, as well as amplifying interest in the other country and raising cultural understanding and tolerance.

Studying abroad is a meaningful educational opportunity, based on experiential learning theory (Kolb, 1984), that can have long-lasting positive impacts on students academically, personally, and professionally (Dwyer, 2004a, 2004b; Kitsantis and Meyers, 2001; VanDerZanden et al., 2007; Williams, 2005). Many programs’ goals are to increase global engagement and awareness, and even short-term experiences can raise cross-cultural sensitivity (Anderson et al., 2006). Universities aim to prepare their students for effective professional and personal roles in culturally diverse global communities and to live in a complex, interconnected world (Hovland, 2014; Iowa State University, 2009). Studying abroad helps students to meet learning outcome requirements in international perspectives, which are common at most colleges and universities.

Study abroad programs include short-term study tours, longer-term immersion experiences, semester abroad, and bilateral programs. Bilateral study abroad programs—in which student groups from two countries exchange visits—are relatively uncommon but provide opportunities to deepen cultural and technical learning. For example, faculty and students host study abroad participants in their respective country, and later travel to their visitors’ country. We developed such a bilateral exchange between ISU and the UCR. The “Intercambio” (“exchange,” in English), a travel exchange program between ISU and UCR, has supported reciprocal visits by student groups annually since 1999. These 10- to 12-d-long tours focus on how crops are produced, managed, and marketed, as well as how insect pests and diseases are managed in Iowa and Costa Rica, whereas students experience a foreign country, language, and culture.

Despite evidence that short-term study abroad trips provide substantial value to students (Institute of International Education, 2015), they are sometimes perceived as “tourism” with minimal impact on student learning outcomes. We investigated whether students derive meaningful, durable benefits from short-term

travel experiences and whether reciprocal exchanges enhance the value of such trips for students. In this article, we address these issues from participants on both sides of the Intercambio experience, using results of a survey of students who participated between 1999 and 2014. We also summarize how the Intercambio was developed and has been sustained, in hopes of inspiring others to develop such exchanges. The objective of the research was to determine students’ opinions of impact on their international perspectives, future education and career goals, and agriculture production knowledge due to participation in the Intercambio experience.

Materials and methods

PROGRAM DESCRIPTION. In 1998, ISU plant pathologist Mark Gleason and UCR plant pathologist Felipe Arauz proposed reciprocal student visits that would encompass on-site student visits to farms and agricultural research sites in each country. At the time, no reciprocal bilateral student-group travel exchanges existed at either university. The plan called for an ISU student group to visit Costa Rica during ISU’s spring break in March and for a UCR group to tour Iowa agriculture in July of the subsequent year, during UCR’s semester break.

ISU students were recruited for a new three-credit, semester-long, undergraduate- and graduate-level course called Integrated Management of Tropical Crops (HORT/PLP/ENT 511). Learning outcomes for the course include that students will be able to describe tropical crop production systems used in Costa Rican agriculture and contrast them with agricultural practices in the United States. They are also able to analyze the accuracy and relevancy of their own world views and anticipate how people from Costa Rica and Central America may perceive that worldview; describe how cultures and societies in Costa Rica are formed, sustained, and evolve; analyze the influence of global issues in Costa Rica and in their own lives; and describe the values and perspectives of Costa Ricans and explain how they influence their individual perceptions of global issues and/or events.

For ISU students, the Costa Rica trip was the centerpiece of a semester-long in-class exploration of tropical cropping systems and Costa Rican

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agriculture. In addition to major export crops of Costa Rica, such as coffee (*Coffea arabica*), banana (*Musa acuminata*), sugar cane (*Saccharum officinarum*), pineapple (*Ananas comosus*), vegetables, and ornamentals, the HORT/PLP/ENT 511 class also includes units on local food systems, integrated pest management, agricultural economics, climate, soils, and the history and culture of Costa Rica. Although UCR students do not enroll in a formal class in preparation for their visit to Iowa, they are briefed during several pretrip meetings about the history of the Intercambio, what to expect in Iowa's agriculture, cultural tips about the United States and Iowa, and trip logistics. They are also encouraged to contact ISU professors if they have potential interest in graduate study abroad, to set up meetings during the visit to Iowa.

The first ISU group visited Costa Rica in Mar. 1999, followed by the first UCR trip to Iowa in July 2000. The Intercambio has persisted annually through leadership transitions as well as natural calamities; for example, a volcanic eruption in Costa Rica delayed the 2015 ISU trip by 4 d.

Financing the exchange differs between ISU and UCR. ISU students pay trip costs (air fare, meals, in-country bus rental, lodging, etc.; cost per student was about \$2400 in 2017) with help from small grants provided by the ISU College of Agriculture and Life Sciences' (CALS) Study Abroad Office. At UCR, students paid a portion of the total travel costs, subsidized by research and teaching accounts of the UCR trip leaders. An important feature is that ISU and UCR hosts defray some costs by underwriting dormitory lodging, sponsoring meals, covering park entrance fees, or negotiating reduced fares with local hotels and bus companies. The result has been thousands of dollars in savings for the travelers during each visit.

SUSTAINING THE INTERCAMBIO. The Intercambio's reciprocal format has created unique ways to amplify cross-cultural student communication. On both sides of the exchange, veterans of past trips become heavily involved when later groups arrive. In this "pay it forward" tradition, former travelers serve as translators, tour guides, and entertainment coordinators, and even host meals at their families'

homes. This continually expanding network of alumni helps visiting students feel comfortable and welcomed by a peer group from the other country. Many international friendships result and are sustained by social media and subsequent visits. An additional advantage of the reciprocal-trip format is that the travel experience can be continually improved by student input. Formal post-trip evaluations help to enhance planning for later trips; leaders modify itineraries for future trips based on written evaluations by recent visitor groups.

Institutional support helped to sustain the Intercambio. Small grants to students, departmental and college funding to underwrite transportation costs, and hosting events for visitors mitigated the financial burden on students. It is equally important to show administrators that there are direct benefits. For example, 10 UCR students earned ISU graduate degrees as a direct result of contacts made during the Intercambio, several ISU veterans of the exchange have been interns in agricultural enterprises in Costa Rica, and several joint research projects, workshops, short courses, and refereed research publications have emerged from the exchange.

SURVEY INSTRUMENTS. In 2015, an online survey, developed jointly by the ISU and UCR leaders, obtained Institutional Review Board approval (Table 1). The survey was comprised of four multiple choice questions, five 5-point Likert scale questions (Likert, 1932), and 10 open-ended questions. The survey was sent to students who had participated in the program between 1999 and 2014. Questions for UCR students differed only slightly from those for ISU students to accommodate institutional and cultural differences and were administered in Spanish. Anonymity of respondents and confidentiality of replies were preserved.

DATA ANALYSIS. Summary statistics were prepared for replies to the Likert scale questions. Open-ended responses were analyzed for themes. The themes most often found in responses were reported in results, and quotes were selected to represent common themes.

Results and discussion

PARTICIPANTS. A profile of students at each university who took part

in the travel experiences and the percentage of survey respondents by year are summarized in Table 2. We located current e-mail contacts for ≈80% of UCR and ISU students who participated between 1999 and 2014. Of a total of 140 ISU students who participated in eight Intercambio trips to Costa Rica between 1999 and 2013, about 90% were undergraduates, primarily from the ISU CALS. Of the 125 Costa Rican students who visited Iowa as part of eight group trips between 2000 and 2014, nearly 100% were undergraduates in the UCR School of Agronomy in San José, Costa Rica. Coincidentally, the total number of students who replied from each institution (ISU and UCR) was 58.

GENERAL ASSESSMENT OF PROGRAM VALUE. All respondents agreed that the trip had a positive effect (Fig. 1); the proportion of those who strongly agreed was 79% for ISU and 95% for UCR. When asked whether the experience continued to have a positive effect on them, 89% of ISU students and 98% of UCR students indicated that it had.

AGRICULTURE KNOWLEDGE. Most participants indicated that the experience provided an opportunity to learn about new crops and their production practices. Among ISU respondents, 42% cited learning about production of tropical crops (Fig. 2), pest management practices in other parts of the world, and organic agriculture (Fig. 3). Twenty-one percent of responses contrasted diversified agriculture in Costa Rica with crop monocultures in Iowa. Sample quotes: "... Pineapples didn't grow on trees? Who knew..."; "I had a chance to see how much work goes into production of fragile export crops such as bananas"; "I saw a different world besides corn, soybeans and alfalfa—and it was amazing!" In addition, 12 responses indicated that the trip opened their eyes and increased their awareness of the world, other cultures, international agriculture, and social issues that relate to agricultural production in tropical countries, including workers' rights and labor force requirements.

Among UCR students, 46% mentioned the opportunity to see different crops and production practices while comparing agriculture in Iowa and Costa Rica (Fig. 4). UCR students also reported learning about graduate

Table 1. Survey questionnaire emailed to 96 current and former Iowa State University (ISU) students who participated in the ISU course HORT/PLP/ENT 511, which included group travel to Costa Rica, between 1999 and 2013. These questions, translated into Spanish and with minor additional changes, were also sent via e-mail to 96 students from University of Costa Rica who had taken part in eight Intercambio exchange groups that visited Iowa between 2000 and 2014.

1. What year did you participate in the ISU class, “Integrated Management of Tropical Crops,” PLP/Hort/Ent 511, that included a tour of Costa Rican agriculture and agricultural research?
2. Which of the following best describes your status at the time of the trip? (ISU undergraduate student; ISU graduate student; other)
3. How old were you at the time of your trip? (16–20; 21–25; 26–30; 31–40; 41–50; 51 or above)
4. Please respond to each statement below (Likert scale: 1 = greatly disagree to 5 = greatly agree):
The experience had a positive effect on me.
The experience had a positive effect on me as an early-career student.
The experience continues to have a positive effect on me.
5. Please briefly explain one way the trip positively affected you.
6. Please respond to each statement below (Likert scale: 1 = greatly disagree to 5 = greatly agree):
I gained new ideas from my experience(s) that I applied to my studies in my major/career
My experience(s) changed the way I thought about and/or experience my major/career.
7. Please share how new ideas gained from the Costa Rican tour influenced your later studies/career.
8. Please share one example of how the experience changed the way you think about and/or experienced your major/career.
9. Were you interested in pursuing horticulture as a career path at the time of the trip? (Yes/No)
10. Please respond to each statement below using your best judgment (Likert scale: 1 = greatly disagree to 5 = greatly agree):
My experience increased my desire to pursue horticulture as a career path.
Following the trip, I did pursue horticulture as a career.
Currently I have a career in horticulture.
11. List one career path you were MOST interested in pursuing at the time of your trip.
12. Please rate each statement below as it relates to your Study Abroad experience (Likert scale: 1 = greatly decreased to 5 = greatly increased):
My tolerance toward people of other cultures.
My ability to communicate with people of other cultures.
My appreciation of my own country.
My interest in current events, culture, history, etc. of Costa Rica.
My interest in current events, culture, history, etc. of my own country.
13. Please share one example of how your tolerance toward people of other cultures increased as a result of the experience.
14. Please share one example of how your ability to communicate with people of other cultures increased as a result of the experience.
15. Please share below on example of how your appreciation of your own country increased as a result of the experience.
16. Please share below an example of how your interest in current events, culture, history, etc. of Costa Rica and/or of your own country increased as a result of the experience.
17. Please respond to each of the statements below regarding the time that has passed since your Study Abroad experience in Costa Rica (Likert scale: 1 = great disagree to 5 = greatly agree):
Since the experience, I have created/found opportunities to interact with people of other cultures professionally and/or personally.
Since the experience, my ability to communicate well with people of other cultures has improved professionally and/or personally.
18. Please share one example of an opportunity you’ve created/found to interact with people of other cultures professionally or personally, and explain how the experience was for you.
19. Please explain one situation you’ve been in when your improved ability to communicate with people of other cultures has benefited you.

school/research opportunities (32%) and new technologies (26%): “I gained familiarity with the equipment and professors of the Department of Plant Pathology”; “We learned about management of huge expanses of monoculture and specialized machinery”; and “...permitted me to learn about and appreciate the extension system and technology transfer established in the U.S.”

Experiencing Iowa agriculture changed UCR students’ views of agriculture. Students developed new ideas on crop production and technology (27% and 24%, respectively) to

apply in Costa Rica: “We were exposed to very different systems—monoculture, polyculture, family agriculture—which was very beneficial”, “the interchange enabled us to observe the diversification of products and understand agricultural practices not common in Costa Rica that we could begin to implement”; “I learned molecular biology techniques, which I am now using in my master’s thesis in crop protection.” Eighteen percent of students also appreciated the global nature of agriculture more after their experience: “It showed me Costa Rica is a grain of sand in the world... if I

wanted to advance professionally and personally I had to get involved outside of the country.”

CAREER INFLUENCE. Among ISU student respondents, 77% agreed that they applied ideas gained on the travel experience to their academic studies and/or career, including 39% who agreed strongly; corresponding percentages for UCR students were 100% and 66% (Fig. 5).

Of the 32 ISU participants who responded to this question, 25% noted that the experience influenced their future interest in working, studying, or traveling abroad. Sixteen

Table 2. (A) Profile of students involved in the Intercambio program between 1999 and 2014. (B) Percent of students who responded to the 2015 survey.

A								
Gender balance among trip participants (%)								
	Female				Male			
	Mean	Range			Mean	Range		
Iowa State University	62.1	47.1–88.2			37.9	11.8–52.9		
University of Costa Rica	45.4	33.3–60.0			54.6	40.0–66.7		
Degree program enrollment when trip occurred (%)								
	Undergraduate	Graduate			No reply			
Iowa State University	80	15			5			
University of Costa Rica	67	31			2			
Age when trip occurred (%)								
	≤20 years old	21–25 years old			≥25 years old			
Iowa State University	29	50			16			
University of Costa Rica	2	76			10			
B								
Year travel occurred	1999	2001	2003	2005	2007	2009	2011	2013
Iowa State University	64.7	37.5	47.6	30.0	25.0	29.4	47.1	50.0
Year travel occurred	2000	2002	2004	2006	2008	2010	2012	2014
University of Costa Rica	20.0	40.0	31.3	37.5	20.0	26.7	60.0	41.7

Fig. 1. Students' written responses to the following survey question about the Intercambio exchange: "the experience had a positive effect on me" (positive effect), "the experience continues to have a positive effect on me" (continues to have a positive effect) [ISU = Iowa State University ($n = 57$), UCR = University of Costa Rica ($n = 41$)]. Likert scale: 5 = greatly agree to 1 = greatly disagree. Data presented are based on emailed survey replies from students who had participated in travel groups between 1999 and 2013; a total of eight trips by ISU students and eight trips by UCR students are represented.

percent stated that this experience influenced their choice of future classes and advanced degree programs, with 16% noting that the trip changed or confirmed their career choice and 13% saying they changed production practices on their commercial farm or hobby garden because of this experience. Students observed, "I am currently practicing vermiculture and growing banana trees... at my home.

Both of these interests stem from the tour..." "I...am currently a high school science teacher. I am working on creating my own student trip to Costa Rica to study agriculture and biodiversity because of the good experience from this course."

ISU participants reported that the experience changed the way they think about and/or experienced their major/career; 33% of responses

discussed horticulture production, with five participants mentioning pest management. Students gained awareness of types and philosophies of agriculture other than those in the midwestern United States. Six percent of students cited sustainable or organic practices as topics they were more interested in because of this experience.

Twenty-eight percent of ISU students mentioned that participants were now more culturally aware and comfortable with international travel: "This experience increased my interest in tropical horticulture and teaching study abroad courses in my future career"; "It increased my interest and confidence to pursue international issues within my chosen profession..." "It cemented my interest in international agriculture and tropical crops and led me to study tropical plant pathology for my Ph.D."

UCR students changed their opinions of and plans for future studies and careers based on their Intercambio experiences. Forty-eight percent expanded their definition of agronomy while traveling in Iowa, incorporating new career opportunities, and possibilities into their views of agriculture. "My career can be as broad as I wish... the trip gave me the vision of the amount of work and study opportunities that exist outside our country," and "This experience influenced my professional career by giving me a more

Fig. 2. Students from Iowa State University experiencing tropical agriculture during group visits to Costa Rican farms and research facilities. (A) Iowa State University students assess coffee samples at Coopetarrazu, a cooperative in Costa Rica. (credit: Barbara Clawson). (B) Iowa State University students with a banana flower at CORBANA, a banana research center in Guapiles, Costa Rica (credit: Brian Nonnecke).

global vision and showing me the diversity of agronomy.”

The Intercambio also increased UCR students’ awareness of research activities in the United States (32%) and imparted confidence to pursue graduate education domestically or abroad as a means to enhance their career opportunities. Students used networking connections from the Intercambio (33%) to gain assistantships: “During the trip, we visited various initiatives to take advantage of biomass; I currently work in this area and am completing my master’s thesis on this topic”; “This trip awakened my interest in scientific research... once returning from Iowa I managed to obtain two positions as a research assistant...”

INTERNATIONAL PERSPECTIVES. Traveling to Costa Rica increased

tolerance toward people of other cultures among 81% of ISU student respondents, including 28% who indicated greatly increased tolerance (Fig. 6). Eighty percent of ISU students also noted that their ability to communicate with people from other cultures had increased; 30% indicated that the trip had greatly increased this ability. Furthermore, 78% indicated that they emerged with a heightened interest in the current events, culture, and history of Costa Rica, including 56% who indicated a greatly heightened interest. Sixty-nine percent of the ISU students indicated that the experience increased their appreciation of their own country (including 30% who felt that their appreciation was greatly increased), whereas half noted that the trip had increased their interest in current

events, culture, and history of the United States, of whom 9% indicated that it greatly increased their interest.

Eighty-three percent of UCR students indicated that the trip to Iowa had increased their tolerance toward people of other cultures, including 46% who indicated that their tolerance had increased greatly. Also, 83% noted increased interest in current events, culture, and history of the United States, including 49% with greatly increased interest. Appreciation of Costa Rica grew for 88% of UCR students (including 29% for whom this appreciation increased greatly), and 80% indicated more interest in current events, culture, and history of their own country, including 37% who indicated greatly increased interest.

Fig. 3. Alvaro Castro shows lettuce seedlings to Iowa State University group on his organic farm in the Central Valley of Costa Rica (photo credit: Barbara Clawson).

Fig. 4. (A) University of Costa Rica (UCR) students climb a grain bin near Boone, IA. (B) UCR students learn how to shuck sweet corn (*Zea mays*) on Rinehart’s Family Farm near Boone, IA (photo credits: Mark Gleason).

Fig. 5. Students' written responses to the survey question about the Intercambio exchange: "I gained new ideas from my experiences that I applied to my studies in my major/career" [ISU = Iowa State University ($n = 57$), UCR = University of Costa Rica ($n = 41$)]. Likert scale: 5 = greatly agree to 1 = greatly disagree. Data presented are based on emailed survey replies from students who had participated in travel groups between 1999 and 2013; a total of eight trips by ISU students and eight trips by UCR students are represented.

Fig. 6. Students' responses to the survey question about the Intercambio exchange: "My tolerance to people of other cultures" (tolerance), "My ability to communicate with people of other cultures" (communication), "My interest in current events, culture, history, etc. of my own country" (interest in my own country), "My interest in current events, culture, history, etc. of the United States/Costa Rica" (interest in host country) [ISU = Iowa State University ($n = 57$), UCR = University of Costa Rica ($n = 41$)]. Likert scale: 5 = greatly increased to 1 = greatly decreased. Data presented are based on emailed survey replies from students who had participated in travel groups between 1999 and 2013; a total of eight trips by ISU students and eight trips by UCR students are represented.

When asked to share an example of how their tolerance toward people of other cultures increased as a result of the experience, ISU participants' responses focused on increased appreciation, empathy, and respect for other cultures and people from different backgrounds. Thirty-eight percent

of respondents discussed their appreciation for Costa Ricans and their culture, including their hospitality, perseverance of students to earn college degrees, and overall differences in cultures. Twenty-five percent of respondents commented about empathizing with people from other

situations including migrant workers, immigrants, and people from less developed countries. Twenty-one percent of responses mentioned respect as their way of expressing their tolerance. They gained respect for innovative and proactive development programs implemented by the Costa Rican government, production practices used by farmers, and how less developed countries contribute to the world: "...while aspects of another culture may seem strange or rude to me, I appear just as strange to persons from the other culture." "... I am more empathetic toward Hispanics in my community now."

UCR respondents similarly appreciated hospitality of their Iowa hosts and noted that the opportunity to learn about Iowa culture first-hand changed their perspectives of the United States (67%). UCR students appreciated the personal interactions with ISU faculty and students and Iowa farmers, allowing them to see "they were people like me, with the same worries and hopes." Seventeen percent of UCR students responded with behaviors, such as changing approaches to receiving a foreign person, working as part of an international team, and taking time to understand another's culture before making judgments.

Increased tolerance of other cultures was reported by 30% of UCR students (Fig. 6). Interestingly, 20% of UCR students had initial negative initial impressions of U.S. culture and were concerned about North Americans' tolerance and attitudes toward Latin Americans; all of these students were pleasantly surprised: "I believed people from the U.S. believe they are better than the rest of the Americas. After sharing with people from rural and urban areas, I realized they are amiable and excellent, so this prejudice was gone"; "The truth surprised me; we received good treatment during the entire visit. It definitely opened doors to understanding and respecting other points of view." UCR students were also surprised by the amount of cultural diversity in the United States, noting they engaged with people of different socioeconomic levels, heritages, and religions. "During the trip we visited an Amish community and a community of refugees from Eastern Europe; in both cases we had the opportunity to see different ways of life."

CROSS-CULTURAL COMMUNICATION.

Ability to communicate with people from other cultures clearly grew as a result of the experience. For example, nearly 95% of UCR students and 75% of ISU students indicated that their competence in cross-cultural communication increased (Fig. 6).

Most ISU participants felt that their ability to communicate with people of other cultures increased as a result of participating in the course. Improvement in their Spanish language skills was noted by 38% of ISU participants, along with increased confidence to venture outside their own culture and ability to understand other cultures. Participants realized that patience while dealing with people from other cultures, respecting other cultures, and listening more enhanced cross-cultural communication: "It reinforced that the efforts to learn and use a new language can yield closer connections, and that a smile and active listening can go a long way to bridge language barriers."

UCR students also reported that the experience allowed them to improve their English speaking and listening comprehension, build confidence in their ability to communicate in a second language, and increase their desire to become more fluent in English (30%, 18%, and 15%, respectively). UCR students interacted with native English speakers including ISU faculty and students and farm hosts, improving their English while listening to presentations and engaging in discussion. Many were concerned about their ability to communicate in English; one even mentioned peer judgment from UCR students who were more fluent in English as a concern. UCR students were motivated to take steps toward improving their English fluency: "My desire to have a level of competence in English led me to begin intensive English courses that have permitted me to have access to people of other cultures."

All 21 ISU respondents to Question 15 (Table 1) indicated that they appreciated their country more because of the Intercambio experiences: "My biggest appreciation for my country came in the form of food. I love that we can eat a variety of foods every meal"; "I learned to appreciate and despise the abundance we have in our country"; and "...seeing agriculture practices in Costa Rica and how

much of it was tough manual labor... made me appreciate the level of automation and mechanized equipment we have to produce our major crops in the U.S."

All 32 UCR respondents agreed that the Intercambio positively impacted their views of their own country. They gained appreciation for the geographical, ecological, and environmental diversity of Costa Rica by spending time in Iowa (43% of respondents): "I appreciated even more the geography of my country...the different ecosystems which we are exposed to in a single day" (Fig. 7); and "[our] biodiversity and distinct climates enable us to plant many different crops." After returning from Iowa, UCR students also saw great potential and opportunities for Costa Rica and themselves (38%): "Each time I learned something about a crop or technology I was thinking how it could be used here in Costa Rica"; and "...[the experience] permitted me to orient my attitude as a professional to the potential for growth that agriculture has in Costa Rica." Through interactions with ISU faculty and students, UCR students realized that their education at UCR was comparable with an ISU student's, taking pride in and appreciating their education (13%). UCR students also appreciated their expertise in organic and specialty crop production in comparison with Iowa farmers (13%): "In Costa Rica there is more experience in disease and insect management for our high diversity tropical conditions"; "This experience enabled me to appreciate the work that organic producers are doing in Costa Rica."

All ISU program participants who responded to the question on interest in current events, culture, and history indicated that their interest had increased and that they were following events, politics, and news from Central America and specifically Costa Rica; they were also interested in the history of Costa Rica and the role played by the United States: "Having experienced a small part of the Costa Rican culture, I am now more interested in any events happening from that country"; "There was a lot I didn't know about their history and it was interesting to see their history and how it was affected by (North) American history"; and "...I am also more challenging of U.S.

Fig. 7. (A) Arenal Volcano, Costa Rica. (B) Iowa State University students visit Playa Rajada, a Pacific Ocean beach in northwestern Costa Rica (photo credits: Brian Nonnecke).

policy and actions because I realize that our interests don't always line up with other countries."

Twenty-one percent of UCR respondents discussed how comparing history between the two countries had increased their interest. UCR students compared perspectives of U.S. culture between their experience in rural America and what is portrayed in the media (16%): "[I]...pay more attention to political and climatic events including agriculture commodity prices... because I think of the people I know there who will be affected." Seeing monoculture crop systems and the relatively homogeneous Iowa landscape made UCR students appreciate their own environment and biodiversity more (9%).

ISU participants subsequently created or found opportunities to interact with people of other cultures by traveling abroad to Europe, Latin America, and Asia. They sought out situations to meet and interact with people from other cultures: "...took another horticultural trip to the Netherlands-still have Dutch friends I made and keep in contact with!," "Going to Costa Rica made me want to visit more of the world, so I travelled to Thailand, on a service

learning trip, and then decided to study abroad for a semester in Australia”; “I participate on multicultural teams on a daily basis”; and “I have been mentoring international interns at the research station where I work.”

Sixty-two percent of UCR students provided examples of how they interacted with people of different cultures after their Intercambio experience. These experiences ranged from hosting visiting students and faculty in Costa Rica—“I receive students from other countries... it was an enjoyable experience to teach them about the many foods of Costa Rica”—to traveling as part of their career—“My work requires visits to the U.S., where I interact with people from various countries including consumers and producers of coffee, to pursuing graduate education abroad.”

ISU participants perceived that their increased ability to communicate with people from other cultures had benefited others as well as themselves. They reported that they communicated better at their workplace (45%) and managed to survive and obtain supplies in a foreign country even when they don’t speak the language, and pursued careers in a “multicultural and multilingual context” (5%). They noted “I find I can often be of help to others who may be travelling abroad for the first time,” “I now live and work in East Africa...the course...was the foundation for...a career in a multi-cultural and multilingual context.” “I responded to a call in the Denver airport for translation assistance from a Spanish speaker. I spent nearly an hour talking with an elderly woman from Ecuador whose daughter had fallen ill in the airport... I felt honored and blessed to put to use my limited Spanish in a way that directly helped someone.”

UCR participants felt that their ability to communicate with people of other cultures had benefited them, mainly through enhancing career opportunities and promotions (47%): “I was better able to communicate with a Mexican laboratory intern..., even though we spoke the same language,

because of my experience in another country.” “I work in certification of organic farms, and ...a U.S. agency...works jointly with us. Knowing the production systems of the U.S. has helped me work with this agency.”

Conclusions

Since 1999, the Intercambio has grown into a thriving program with deep roots in both Iowa and Costa Rica. In addition to strengthening a bridge between institutions, the exchange, as documented by survey results, has had profound and durable effects on students’ careers, cross-cultural perceptions, and communication skills. To further enhance the program, future goals include facilitating online forums in advance of group travel experiences to help students on both sides learn about each other before visiting groups arrive and to sustain communication after the travel ends.

Dedication

This article is dedicated to the memory of Sr. Alvaro Castro Gómez, from the town of Cipreses de San Rafael de Oreamuno, Costa Rica, who died unexpectedly on 27 Apr. 2015. Sr. Castro, a pioneering organic vegetable producer and leader in Costa Rica, inspired hundreds of students and growers with persuasive, enthusiastic on-farm teaching (see cover photo). He hosted and fed many UCR and ISU student groups at his small farm and infused visitors with his passion and breadth of knowledge in organic agriculture. He lives on in memory as an extraordinary father, husband, farmer, teacher, and leader.

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