



# Teaching Construction in an International Society through Study Abroad and Service Learning in Costa Rica

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## Abstract

One goal of Purdue University, the College of Technology, and the Building Construction Management Department is to infuse global awareness in both undergraduate and graduate students. A study abroad course is one way to accomplish this goal. International experiences, especially service learning, give students an extended application of knowledge outside of their comfort zone. Students must apply their knowledge to solve problems while also dealing with the newness of an international place. A study abroad trip to Costa Rica includes a service learning project fulfills this requirement. Service learning enhances the student's learning through applying work ethic, critical thinking, problem solving, social issues, and reasoning to real world projects (Batchelder & Root., 1994; Hatcher & Bringle, 1997 & Eyer, Giles, & Braxton, 1997). A faculty member has partnered with the Rotary International in Costa Rica to make this experience happen. The experience adds to their marketable skills when entering the workforce. Most students in this department tend to be kinesthetic learners so participating in a hands-on service learning project allows them to apply technical knowledge and utilize management skills. This paper outlines the development, facilitation, and evaluation of a study abroad experience in Costa Rica.

**Keywords: Service learning, undergraduate education, Study Abroad, Globalization**

## Introduction of Service Learning

The original fathers of curriculum believe that there was a link between community engagement and actions which apply knowledge (Dewey, 1933). Service learning is already a very well researched topic. According to the National and Community Service Trust Act of 1993, it is defined:

“A method under which students or participants learn and develop through active participation in thoughtfully organized service”  
(National, 1993)

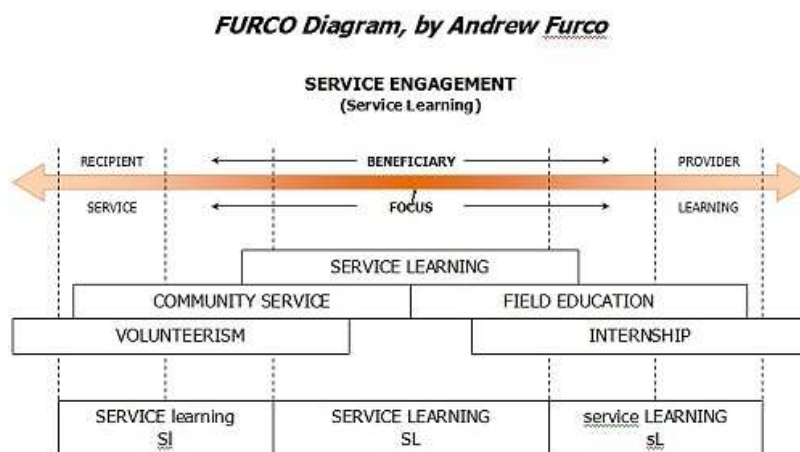
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Not all see Service Learning as an academic replacement for the pencil and paper calculations or controlled lab experiments, but those who support these have had positive results. The Kolb (1984) model for learning aligns well with service learning because it allows for all types of learners and it involves concrete experience (Kolb, 1984). Broader definitions have been used to outline the relationship between the service and the learning.

“a type of experiential education in which students participate in service in the community and reflect on their involvement in such a way as to gain further understanding of course content and of the discipline and its relationship to social needs and an enhanced sense of civic responsibility.” (Hatcher & Bringle, 1997).

A very popular diagram to visualize this concept is through the Furco diagram in Figure 1. The main objective of this model is to differentiate volunteering and field experiences to overlap with the academic component to produce a true service learning experience.



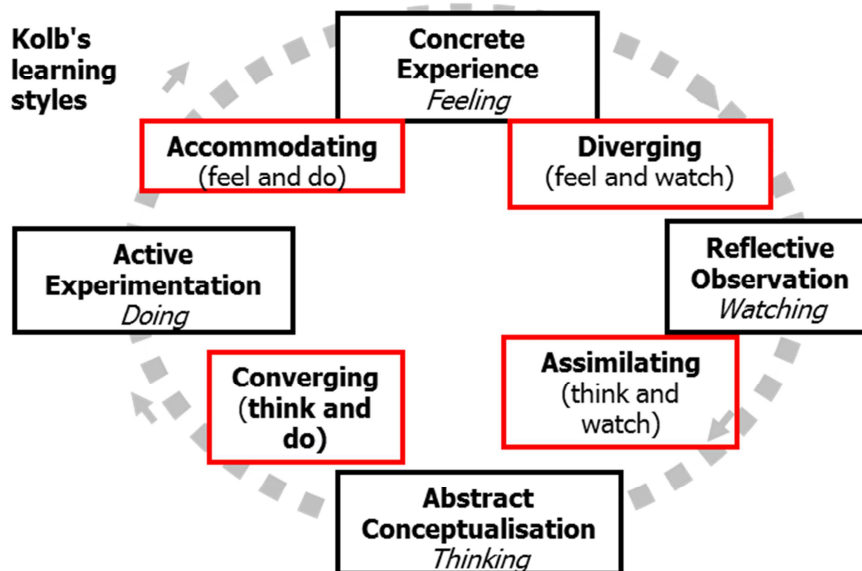
**Figure 1: Furco Service Engagement Diagram (Furco, 2002)**

Much of the research concludes that service learning enhances the student’s education including the areas of: work ethic, critical thinking, problem solving, social issues, and reasoning projects (Batchelder & Root, 1994; Bringle & Hatcher, 1999; Hatcher & Bringle, 1997 & Eyler, Giles, & Braxton, 1997). When these service learning activities have occurred during a study abroad program, the outcomes included: cultural awareness, foreign language skills, and construction materials and methods (Connell & Lu, 2009 & Farrow & Kramer, 2009). Some of the common outcomes reported by the students include:

- Greater motivation
- Ability to integrate
- Development of leadership and communication skills
- Accessing understanding in different ways

- Teamwork
- Project planning
- Life-long learning

The final part of the service learning experience is to ensure that the students are connecting the activity to the academic objectives (Eyler, 2001). Figure 2 shows the Kolb Learning Style model which aligns well with a service learning project. Students work through the learning cycle as they experience different abilities. The concrete experience ties the students to the feelings they are facing. The reflective observation is done as the students connect existing knowledge with how it can be applied to a service project.



**Figure 2: Kolb learning styles model adapted based on Kolb 1984**

The international component also involves the abstract conceptualization of thinking about what is going to happen before the active experimentation occurs. This is done by reflection activities throughout the experience. It is important to assist the students into differentiating the learning experiences. The reflection should connect with, but not be limited to, academic context and learning objectives, personal experience, connection to and implications for the profession/discipline, and or social/community issues. Methods of facilitating the reflection process include: written questions, notebooks, journals, blogs, small group discussions, readings, or any combination. Many teaching points may not be seen as learning by the student if he or she does not reflect. Another aspect of the learning may not be technical, but rather about communication or social learning which is more difficult to assess. The interaction with the students during reflection and through facilitated discussions showed the moments of awareness of their surroundings.

## **Development of Costa Rica Service Learning Program**

A core curriculum learning outcome at Purdue University in the United States is global awareness. A study abroad course is one way to accomplish this goal. International experiences give our students an edge over other students and allow them to apply their knowledge to solve problems outside of their comfort zone. This study abroad program was developed through shadowing an existing program and making connections in country for future trips.

The College of Agriculture at Purdue University has a long history of study abroad programs so this program was used as a model for development of a Building Construction Management (BCM) course. The initial Costa Rica trip and project was done with this program. Construction management (CM) students in partnership with agriculture students embarked on a 20-day trip to Costa Rica in May 2011. The original trip with Agriculture students included traveling to remote areas of Costa Rica and allowed only one day in the capital city of San Jose. The service projects were located in the Limon, Guacimo, and Iroquois Community. This is approximately 80 kilometers Northeast of San Jose. There were 10 students who worked on the renovations on a health clinic in the community, and a room addition on a home. This trip led to relationships and knowledge of the country that would be the basis for the BCM experience.

The outcomes for this trip became the basis for the BCM department experience. Some lessons learned include changing the timing of the trip from May to March. The CM students have a requirement of 800 hours of work experience to obtain a Bachelor of Science degree so a Spring Break trip, rather than a May to June trip, better accommodates their schedule. The trip was also connected to an embedded course which met twice per week throughout the semester, before and after the trip. This allowed the students to learn about the culture, practice the language, plan for the service project and apply for grants to fund the service project. It also served as a chance for some team building to enhance the overall experience of the trip.

## **Facilitation of the Project**

The number of students permitted to take the trip will have a minimum of 10 and a maximum of 20 students. Students must have successfully completed one semester of courses and be in good standing with the university to apply for the study abroad program. Both undergraduate and graduate students are invited to participate. Graduate students would be expected to take a leadership role on the service learning activities if participating. Students in the College of Technology are targeted, but the course will be open to students outside of the college. In Spring 2013 19 students are enrolled in the course and include not only BCM, but Animal Science, Aviation Technology, Nursing, and Electrical and Computer Engineering Technology. All food, travel to and from Costa Rica, travel in Costa Rica, excursions and accommodations will be covered in the cost of the course. Spanish lessons will be included in the course to assist the student in communication within Costa Rica. All of the tours scheduled for the trip include an English speaking guide. The course content will include: culture and history of Costa Rica, common building practices, geography, and language. Materials and methods of building

materials including topics related to sustainable and green products and connecting with the Technical Institute of Costa Rica. Costa Rica has the motto of *Pura Vida* translates pure and life so students would stay true to this by exploring the sustainable solutions to building methods in Costa Rica. The session after the trip will be to reflect and document the service learning experience.

The students met twice a week before the trip to learn about the culture, history, food, and language of Costa Rica. Team building activities were developed to help the students bond as a group to make the trip a positive experience for all. Students completed pre trip reflections and assignments to assess the impact of the experience. There was a high level of stress and anxiety when they were reflecting on what to expect. They not only become comfortable with each other, but through the pre-planning they become more confident. Students from past trips serve as guest speakers and a graduate student from Costa Rica also serves as a teaching assistant.

The highlight of this course is a week-long trip to Costa Rica during Spring Break. The daily schedule is shown in Table 1.

**Table 1: Daily Activity Schedule in Costa Rica 2012**

Date	Day	Activity
9-Mar	Fri	Travel
10-Mar	Sat	Culture, Coffee tour and Museums
11-Mar	Sun	Culture, Volcano, Earthquake damage and waterfalls
12-Mar	Mon	Construction site tour, project pre planning and material purchasing
13-Mar	Tue	Service Project
14-Mar	Wed	Service Project
15-Mar	Thu	Technical Institute of Costa Rica and Hydro Electrical plant tour
16-Mar	Fri	Travel

Student participants began at the university took a bus to the airport together and boarded a flight. Upon arrival in Costa Rica, they were met by a bus to take them to the accommodations. The students stayed in San Jose, Costa Rica in the La Sabana neighborhood. The lodging was a hostel type home where a large dormitory room was one for male and one for female students. The faculty advisor had a private room. The neighborhood was across from a large park, the national football stadium, and within walking distance to shopping and dining needs. An activity room at the hostel had internet and a pool table. Breakfast was provided and supplemented with local fresh fruits.

The first two days of the trip were tourist type events with the Coffee plantation tour, Museums in downtown San Jose, shopping, a volcano crater, waterfall, butterfly sanctuary, and aviary

tours. Upon completion of those days, work would begin on the project. A meeting with representatives in Costa Rica gave us the information needed to purchase materials. Students toured a construction site. The project utilized Lean Concepts for project productivity including the last planner system. The construction site project was a seven-story hotel and casino a group photo is shown in Figure 3.



**Figure 3: Students visiting construction site in Costa Rica**

Representatives from Rotary International were utilized to organize the service learning project. Every community in Costa Rica has a school for up to sixth grade. In remote areas, there are sometime maintenance needs that cannot be completed by the local population due to lack of materials, funds, or skills. Before arriving in Costa Rica the students were informed that they would be working in a school. Paint and tile would be provided for this project by the Rotarians. Students received a grant of \$700 in spring 2012 and \$1475 in Spring 2013 from the Purdue University provost's office to purchase the remaining materials which included brushes, mortar, grout, rollers, etc. After the construction site tour, the students visited the Epa (construction big box store) to purchase materials. The project was described as painting and tile work in a school cafeteria. Some specific needs included some shelving for pots and pans. Colors for the school were determined by the government so a special mix was prepared at the store.

The service project became a challenge at all levels for the students. The learning styles of the students were revealed as some watched and pondered the situation before becoming actively involved in the doing. Some students were outside of their comfort zone and took longer to become a part of the work. Small children at the school watched the process and transformation of the school. An evaluation of the situation after day one of the project revealed the students connection, commitment and ownership of the project.

## **Evaluation**

Much of the learning was done through observing the surroundings. Comparing and contrasting U.S. versus Costa Rica to better understand construction materials and methods were a major

theme. The team work also challenged students to step up and utilize leadership, communication and coping skills to complete the project in a safe and timely manner. Student reflections from the Costa Rica project indicated that they enjoyed helping the community and interacting with the community. Comments related to problem solving skills included:

1. Materials were not like the U.S. so we had to use what we were given
2. Shortages of materials required solutions which would not be used in the U.S.
3. Culture differences required problem solving and Spanish knowledge

As part of every class, student evaluations were given at the end of the semester. Student rated the course a 4.9 on a 5.0 scale (5.0 being strongly agree). Additional questions were added to evaluate the service learning component of the course. Table 2 shows the questions and the group mean for the class.

**Table 2: Course Evaluation Service Learning Questions and Score out of 5.0**

Student Evaluation Questions	Mean
Learning was more meaningful in this class than other classes I have taken	4.9
I took more responsibility for my learning in this class than I typically do in other classes	4.7
The community service was relevant to the academic course materials and content	5.0
I was more motivated to learn in this class than in other classes I have taken	4.0
I felt my contributions were appreciated by the community partner	5.0
The class made me realize that it is very important that I help others in my lifetime	4.9
I think all students should take a service learning class	4.9

Additionally the instructor had the students complete a writing assignment and reflection on the trip. Some of the student quotes from the reflections are included below:

“During this trip, I grew as person. Traveling with a group of people I did not know very well was a scary experience in itself. But the whole group agreed that we wanted to get as much as we could out of the trip, which was very helpful in making the trip a fun experience

“Having an open mind to try new things made the trip wonderful and a great learning experience.”



“A study abroad trip is something I had always heard people talk about but I did not realize how much I could learn from study abroad until I did it myself.”

“The service project during our trip to Costa Rica I believe was a big success and not only an educational experience, but also a life enriching experience. One of the main reasons I chose to go to Costa Rica was because I wanted to give back and make a difference in another person and families lives. The service project for me was what made the whole trip complete and made it a success. The service project had a large impact on me as a person as well as the entire community.”

“My trip to Costa Rica was an experience of a lifetime. I am so glad that I was able to find personal funding to go on this trip, as it was worth every penny.”

“I can't really pin point to one thing I loved the most because I love everything I saw and got to experience in Costa Rica.”

## **Conclusions**

Service learning courses align well in construction management programs and can be useful in creating positive community engagement. Faculty can grow from the experiences through collected data that can be used to create scholarly work or build new projects. Students, faculty, and community partners can continue to find ways to fund projects with grants aimed at making these connections and continuing the solutions to solve grand challenges and problems facing humankind. This experience fulfills the learning outcomes for Purdue University's common core and continues to create opportunities for synergy and collaboration and instill the sense of lifelong learning in all students who participate. It becomes a model for other courses to follow as a sustainable experience for students.

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