

Evaluate the Impact of a Summer Study Abroad Program to the Students in Construction Management

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Despite the growing popularity of study abroad in higher education in recent years, study abroad programs in construction management are not commonly seen. A summer study abroad program specifically designed for construction management students is offered in the East Carolina University in 2008. The students and organizing faculty went on a three week trip with carefully designed activities as incorporated into course studies. It has always been a challenge to measure the impact of study abroad programs on students, especially in terms of their academic gains. This research represents an attempt to record the changes in the participating students with a pair of surveys and interviews. The survey results shows to a certain degree that the students grew in their global perspectives, developed personally, and acquired new knowledge in construction management. However due to the small sample size and preliminary nature of the program, the results cannot be construed as reliable and conclusive. Additional work has been planned in conjunction with future study abroad activities.

Key Words: Summer Study Abroad, Construction Management, Career Guidance, Globalization, China.

Introduction

Summer study abroad programs have become a popular form of international study in recent years and endorsed by many universities and educational institutions (Fischer, K., 2008). Students travel with their professors to a different country and/or culture to gain experiences they would otherwise cannot get at home. Summer study abroad in the field of construction is not commonly seen. Summers are more often used to gain the required hands-on experience in the construction field that fulfills the internship requirement for graduation in many construction curriculums. It is not only an issue with the conventional mindset of students and faculty about the study abroad program, but also there is little evidence that prove the specific value of the study abroad experience has for construction students.

The Department of Construction Management at the East Carolina University offered the inaugural summer study abroad program to China in summer 2008. Three primary study objectives of the program are: (1) Construction Globalization, (2) Comparative understanding of construction industries in the U.S. and China, and (3) Career impact on the students. A pre-trip survey and a post-trip survey are used to determine measurable changes in the participating students. It provides preliminary indications regarding to what level the program goals were achieved. Additional comments are solicited from the students through an exit survey of positive and negative impressions and student written feedbacks on the course website on the blackboard.

Literature Review and Objectives

History and research on study abroad and exchange dates back to 1930's (Themudo, D., et al 2007). Early study abroad programs are often associated with language study and yearlong stay in a foreign country. The number of students participating in study abroad programs has increased nearly 150% in the past decade, to almost 241,800 in

2006 (Fischer, K., 2008). An increasing number of students joint programs shorter than 8 weeks instead of traditional semester long study.

Research literature can be found on study abroad and international exchange including many on program assessment and impact on the students. People involved in these programs often speak intuitively about the benefits of these programs. Many of these claims have been confirmed by research. An earlier study (Wilson, A. H., 1993) interpreted the benefits of studying abroad as four aspects within two categories: (a) global perspective, including substantive knowledge and perceptual understanding; and (b) developing self and relationships, as in personal growth and new interpersonal relationships. Participants of study abroad programs “acquire global-mindedness, grow intellectually, and develop personally” (Hadis, B. F., 2005). A lot of studies focus on specific issues such as cross-cultural skills, global understanding, culture sensitivity and communication skills (Williams, T. R., 2005, Kitsantas, A., 2004, DeLoach, S., et al, 2003). Language acquisition is still among one of the major benefits but often become secondary in comparison to professional growth and personal development. Many of these attributes if not all are critical to the education and development of construction students and professionals.

The top three areas of studies for study abroad programs in the past 10 years in the U.S. are social sciences, business & management, and humanities (Institute of International Education, 2008). Only 3.1% of the participants of study abroad programs in the 2006 academic year are in engineering. There are very few reports about study abroad in construction management. The most noticeable example is the European study abroad class in the Auburn University offered since 2000 (Kramer, S.W., 2007). Even though extensive research on the impact of study abroad programs in general has been conducted, precedence of academic impacts in specific areas of studies is hard to find (Hadis, B. F., 2005).

This research effort was inspired by many issues as mentioned above. In addition to the generic benefits that all study abroad students may enjoy, construction management students may achieve certain learning outcomes in areas specific to construction. It's worthwhile to get a preliminary reading of what changes exactly may have occurred to these construction majors after participating in a study abroad program. It is expected that the students may gain a certain level of global perspective and achieve personal growth. They are also expected to acquire knowledge of construction management at a global context.

Program Overview

A team of four faculty members with diverse background was involved in the planning and execution of this program. The team has a combined background in engineering, architecture, and construction, as well as a wealthy amount of international experiences. Because of these, the faculty members are capable of offering the best guidance possible to the students with regarding the two courses offered within the program. The courses are distinctively different in nature:

- **CMGT 4xxx Construction in China: Challenges and Opportunities (Independent Study):** This course offers students an opportunity to gain their first hand experiences with the construction industry and construction education in China. Activities include visiting ongoing construction sites across sectors and major projects completed in recent years; panel discussions with industry professionals, students and faculty members from major academic programs; as well as visiting historical sites and buildings. The students study construction as a profession in a global context and maintain a competitive edge in the globalization of the construction market.
- **CMGT 4xxx Chinese Building Traditions:** This course will examine the construction practices of China and the US using the comparative method of study founded by Sir Banister Fletcher's History of Architecture. The course will examine selected projects and construction sites in China from an experiential and interactive approach, i.e. visiting the actual constructed project and given a guided study with professionals from the construction and architectural professionals and by use of construction documents.

The program was initially designed to accommodate 20 students but only 13 students enrolled. The students earned 6 credit hours from this program. They were required to attend orientation sessions before the trip, complete a number of assignments during and after the trip, and participate in group discussions with their peers, the faculty,

and the representatives from the hosting institutions. They were also required to complete surveys before and after the trip to evaluate the impact of this program on the students.

The students and faculty went on a three week trip and visited four major cities in China: Beijing, Tianjin, Shanghai, and Zhengzhou. These cities situated across a large region in China and offer a rich blend of culture and history. They also represent the regions in China with the most active construction activities and a large number of landmark buildings. The group visited five categories of sites with more than 40 points of interests, which all contribute one way or another to the predetermined course objectives:

- Ongoing construction sites
- Landmark projects completed in recent years
- Historical sites and buildings
- Academic programs in construction management and civil engineering
- U.S. construction companies in China

Throughout the trip the students and faculty interacted with industry professionals, students and faculty members from major academic programs in China, as well as people from all walks of life. The program also gave the students a chance to appreciate Chinese culture especially in the aspects of history, art, architecture, and cuisine. The summer study abroad program also has elements to provide the students career guidance in the context of globalization. The seminars hosted by major U.S. construction companies operating in Shanghai prove to be especially beneficial. Many students come to realize their career choices are not limited within the U.S. It was also brought to their attention the unique challenges in international construction.

Research Methodology

Since this program is being offered for the first time, the organizing faculty was overwhelmed with many practical matters such as curriculum design, logistics, and travel arrangement (see another paper submitted for review). Research activities can only be accommodated to the extent that won't interface the successful delivery of the program. As a result the only research instrument in evaluating the impact of this program on student participants is a pair of simple surveys delivered before and after the trip. It represents a primitive attempt to gauge the magnitude of impact on the students regarding both issues common to all study abroad students and those unique to construction students. Additional development effort is required to conduct similar research but with more refined tools during any future trips. The current survey questions fit in three categories:

- Student Information and Background Knowledge: 7 question in the pre-trip survey only.
- Impact Evaluation: 12 pairs of questions in both pre and post trip surveys.
- Program Evaluation: 6 questions in the post-trip survey only

Table 1
Selected Survey Questions

Categories	Pre-trip Survey Questions
Objectives	Please check the top three things you want to achieve during this trip
Globalization	Have you noticed any sign of globalization in your personal life in the US?
	Have you noticed any sign of globalization in the construction industry in the US?
	How much do you think the construction activities in China may impact your job as a construction manager in the US?
China's Construction Industry and Comparative Study	How much do you think you know about the construction industry in China?
	How much knowledge do you think you have about historic projects, form function, materials and history of China?
	Speculate the level of difference between China and US in these specific areas (7) in construction. See analysis
Career Guidance	Do you think the principles about construction (or your major) you have learned in US still apply in China?
	If an international contractor were to offer you a position in their Shanghai office after you graduate, would you seriously consider it?

The scope of this paper is limited to the impact evaluation. Many of the students have traveled outside of the U.S. but none of them has ever been to China and is familiar with construction management in a global context. It was expected that the trip would have significant impacts on the participants regarding a wide range of issues. The survey contains questions regarding the students' opinions and knowledge about globalization, China's construction industry, construction management in general, and their future career choices. Table 1 shows sample questions from the survey questionnaire. Because of the nature of summer study abroad programs, structured lectures and comprehensive exams commonly used in traditional course study are either not applicable or ineffective as teaching and evaluation tools. Many survey questions rely on heavily the self assessment of the students.

An obvious difficulty of a study like this is the sample size. Only 13 students participated in the program. Any conclusions drawn upon data collected in this study won't be statistically sound. But nevertheless such an attempt built a foundation for future research efforts on this subject. Subsequent summer study abroad trips in upcoming years will provide additional samples to this study and therefore increase the data quality. Survey questions currently in use are expected to be included in future survey instrument and have to be placed carefully to minimize distortion of the survey results.

Results and Analysis

The pre and post trip surveys were conducted as planned and received nearly 100% participation. The pre trip survey was a paper based questionnaire distributed during an orientation session. The post trip survey was implemented on the Blackboard two weeks after returning to the U.S. The section summarizes primary findings from the surveys.

Eight specific program objectives were identified based on the course objectives. The students were asked to select three objectives they want to achieve the most before the trip and actually achieved in their own opinions after the trip. The results are shown in Figure 1. The top three items selected before and after the trip are identified and in consistent with the primary goals of the program: "Visit historical sites and experience China's culture and history", "Learn about the construction industry in China", and "Study traditional Chinese buildings and architecture". However many students unexpectedly realized learning about the construction education in China was among the top three takeaways of their trips. "Learning Chinese language" was another unexpected objectives achieved for some students.

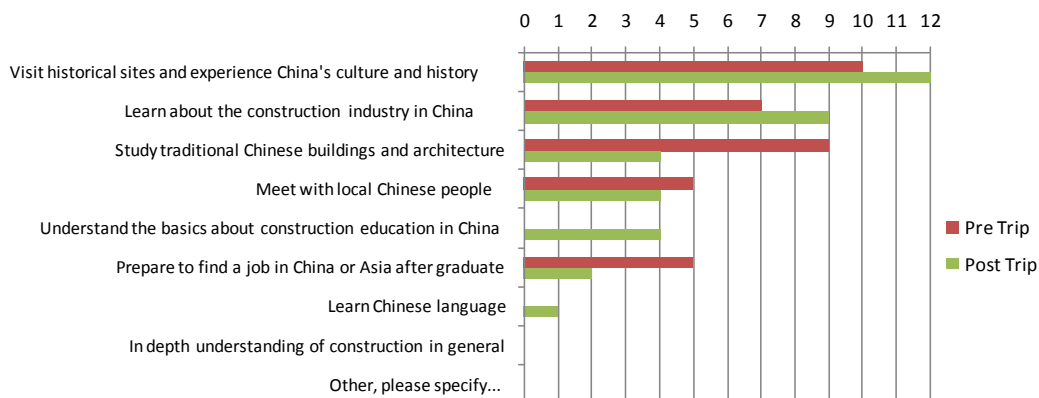


Figure 1 Program Objectives as Perceived Prior and After the Trip

A pair of similar questions was inserted into the surveys to measure the students' perception of globalization. The students were asked about their perception of globalization in the U.S. After the trip they were asked about their perceptions of globalization in China. Many students agreed globalization in their personal life is more noticeable than in the U.S. Construction Industry. However the students felt more strongly about the level of globalization in China as in both the Construction Industry and people's life. They also believe the Construction Industry of China is more globalized than people's everyday life. This may be attributed to the fact that the students received more exposure of the Construction Industry than people's personal life. Many issues related to globalization were brought to the students' attention during the visit. It is obviously easier for the "outsiders" to notice any outside influences.

The Construction Industry in recent years has experienced a series of events showing strong correlations between the construction activities in China and the U.S. A well known example is the material prices. Undergraduate students do not always keep up with the current events in the Industry. The surveys asked the students to evaluate the connection between China’s construction activities and their jobs as construction managers in the U.S. 40% felt that they are not certain about this before the trip. But after the trip a majority of them believed construction activities in China could either impact or strongly impact construction in the U.S. Figure 2 shows the details.

Table 2
The Student’s Perception of Globalization in the U.S. and China

	Have You Noticed Any Signs of Globalization in the U.S.?		Have You Noticed Any Signs of Globalization in China?	
	In Construction Industry	In Personal Life	In Construction Industry	In People's Life
Strongly Agree	25.00%	50.00%	58.33%	33.33%
Agree	33.33%	41.67%	41.67%	66.67%
Neutral	41.67%	8.33%	0%	0%
Disagree	0%	0%	0%	0%
Strongly Disagree	0%	0%	0%	0%
Not Applicable	0%	0%	0%	0%
Unanswered	0%	0%	0%	0%

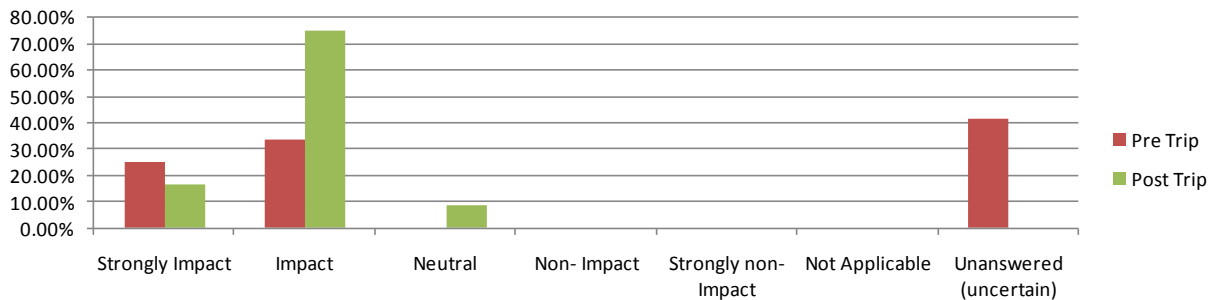


Figure 2 Evaluating the Impact of China’s Construction Activities to Construction in the U.S.

The students were asked to evaluate their knowledge of China’s Construction Industry before and after the trip. Only 25% believed they had some knowledge of China’s Construction Industry. All of them believe they have gains some knowledge of the Construction Industry in China. After the trip 8% of them believed they knew “a lot” on the subject. However because answers to this question were based on the students’ self evaluation, it does not provide sufficient proof that the students have in fact mastered a comprehensive understanding of the Construction Industry of a foreign country in three short weeks. But nevertheless it demonstrated that the students have gains some new knowledge in the subject area during the trip.

A similar question was asked about historic projects, form function, materials and history of China. The responses collected were very similar to the last question. However the percentage of students who believe they know a lot on the subject has jumped from 0 to 25% after the trip. It probably shows the program has accomplished more in teaching the historical aspects than the current status of China’s Construction Industry.

The surveys contain 6 questions concerning the career choices of the students in the era of globalization. The group visited the China Offices of Caterpillar, Fluor, and CH2M-Hill. Prior to the trip only one third of the students were aware of the presence of U.S. construction companies in China. When asked about the applicability of the construction skills they are learning in school, almost all of them believed they should be fine in China.

The Summer Study Abroad program visited some top construction management programs in China. The students interacted with the students and faculty and gained some firsthand knowledge about these programs and the

students' life. Figure 3 shows the students' opinion about China's construction programs. Over 40% of the students felt they didn't have enough information to form an opinion before the trip. The percentage of this group dropped to 8% after the trip. However the students failed to reach a consensus regarding if these programs are similar to the U.S. construction programs. Over 40% of the students believed the programs are somewhat similar to construction programs in the U.S. However 25% thought these programs are very different from the construction programs as they know in the U.S.

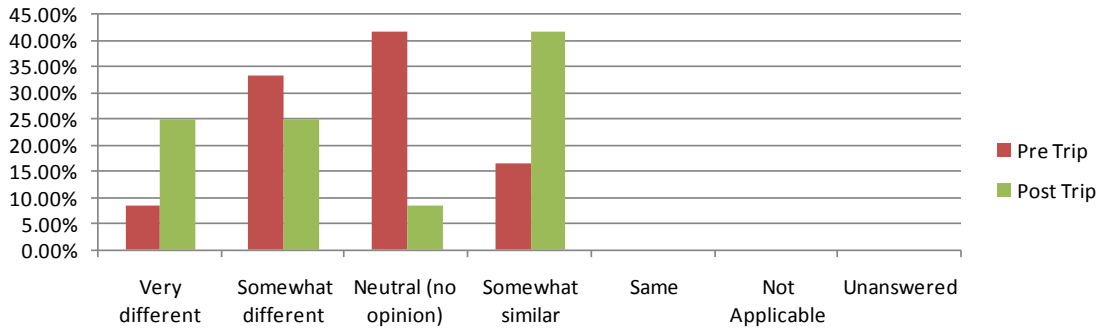


Figure 3 The Students' Speculation/Evaluation of China's Construction Management Education

The students were asked how difficult they would think if they had to work with a graduate from one of Chinese construction programs in a professional setting. Both pre and after trip survey show over 90% of the students believe it would be very difficult or somewhat difficult. This result may indicate that the students' interactions with the Chinese students are either insufficient or superficial.

The students were asked if they would accept a job offer from an international contractor in Shanghai before and after the trip. Despite the fact most students were uncertain about working with local professionals, 75% of them said "yes" to this question before the trip, 90% said "yes" after the trip. Currently a number of student graduating in Fall are actively searching for overseas job opportunities.

Studying in a graduate program was not considered a realistic option for the students before the trip. During the trip the students spent a considerable amount of time in Chinese Universities and research centers. A new question was added to the post trip survey asking about if the students are willing to pursue a graduate degree in a Chinese construction management program. 50% of them said they would.

Comparative Understanding of the U.S. and China's Construction Industry

Prior to the trip the students were instructed to actively compare ten subject areas between the Construction Industries in the U.S. and China. The exercise served a dual purpose. It was a roadmap for the students to conduct their comparative observations during the trip. This exercise also served as a tool to evaluate student learning of these issues in the context of comparative study. The students rated perceived differences in the subject areas with a scale from 1 to 7, with 7 as "very different". The results are in Table 3.

Table 3

The Students' Perception of Differences between China's and the U.S. Construction Industries

Subject Areas	STDEV	Pre-trip Rating	STDEV	Post-trip Rating
Design	1.946	4.833	1.703	4.700
Construction Materials	0.900	2.917	1.054	3.000
Construction Techniques	1.435	4.667	1.317	4.200
Project Management	1.651	4.000	1.430	4.400
Contracting and Project Delivery	1.586	4.167	0.919	4.800
Quality Control / Administration	1.826	4.667	0.994	5.100
Labor Issues	1.801	4.833	1.197	5.900
Safety	2.082	5.167	0.316	6.900

Sustainability	1.992	4.833	1.506	5.600
Culture Issues and Team Building	1.782	4.417	0.994	5.100
Overall	1.435	4.667	0.876	4.900

Figure 4 is a graphic representation of the data in Table 3. The average ratings on most items before the trip were between 3.0 and 5.0 with high standard deviation. It indicates the students could not form any clear consensus on the level of differences in any subject areas. The “construction material” seems to be the only exception. Students expected China most likely uses similar construction materials as in the U.S.

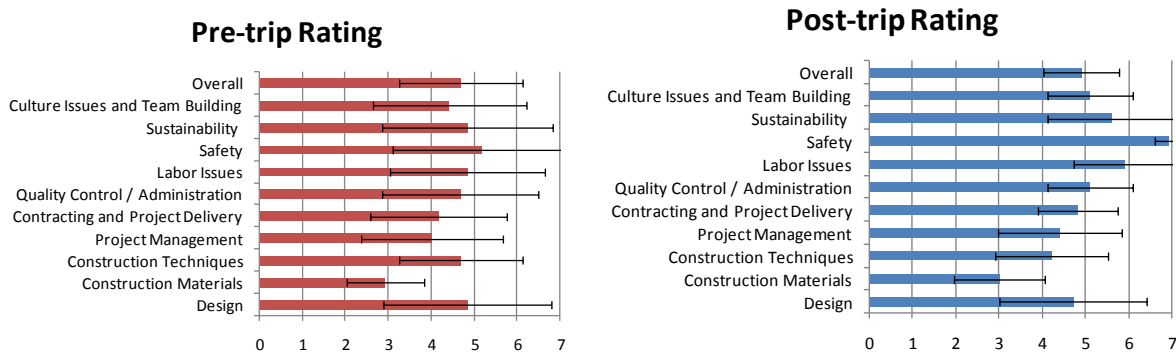


Figure 6 Graphic Comparison of the Student's Perceptions of the Differences between China's and the U.S. Construction Industries

The post trip rating changed significantly in comparison to the pre trip data. The students perceived “Safety” as the most different item between China and the U.S. practices. Construction materials remained as the most similar item. Average ratings for all other items did not shift significantly. However almost all items have lowered standard deviations, which indicates the trip helped the students formed some consensus on many of the identified issues.

This exercise was designed to measure the students' understanding of the subject matter and serve as an encouragement to the students on their critical thinking and skills of comparative study. It is not by any means a valid research on the differences in these ten subjects between China and the U.S.

Conclusions and Future Work

The 2008 summer study abroad program in construction management was a success in terms of planning and execution. The students studied construction management in a global context, conducted comparative and critical thinking with many critical issues in the construction, and obtained a dimension in their career choices. Attempt was made to evaluate the impact of this program on the participating students. The data collected shows evidence that many of the program goals have been achieved. The data collected support to a certain degree that the students grew in their global perspectives, developed personally, and acquired new knowledge in construction management. However because of the small sample size and simplicity of the survey instrument, the results cannot be construed as reliable and conclusive.

This research effort fits in the broader picture of program assessment for study abroad programs. Institute for the International Education of Students developed a framework (IES Abroad, 2008) for assessing study abroad programs. The framework identified four academic areas of study abroad that should be assessed: (a) student learning environment, (b) student learning and the development of intercultural competence, (c) resources for academic and student support, and (d) program administration and development. Future study abroad program will use this framework as a guideline for a more structured assessment plan. There are plans for a 5-year longitudinal study of these students to learn how this trip affects their careers. This data will be useful and more convincing as to the results that such an experience can bring about in the lives of students and faculty.

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