

# International Collaboration: An Emergent Opportunity in Construction Management Education

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As the world continues to advance toward a more interdependent global economy, opportunities to participate in construction projects will expand for the graduates of construction management (CM) programs. To prepare students for these global opportunities, CM programs need to expose students to the unique challenges they are likely to encounter when working on international projects. In addition, the faculty in CM programs throughout the world have much to gain by increasing the opportunities for sharing their experiences. While there has been an exchange of ideas and research through conference meetings and proceedings, the rate of international collaboration has been somewhat limited. Without the benefit of sharing successes and failures, the work taking place in each country or region, as they build the construction body of knowledge, will continue to be duplicative. This paper describes some of the opportunities and challenges in international collaboration along with the author's recent overseas experience. Suggestions for activities that will support global experiences for CM students as well as activities for faculty to promote sustained growth in international CM dialogue are provided. The global goal of increased sustainability of the built environment through energy efficiency is used as an example of an international collaboration that can be implemented in the near term. In addition, suggested best practices to promote international collaboration are provided.

**Key Words:** Global, International, Study Abroad, Sustainability, Energy Efficiency

## Introduction

Altbach and Knight make a distinction between globalization and internationalization. They consider globalization to be more related to the economic, political or societal connections among countries while internationalization involves the policies and practices of educational institutions. While not all authors recognize this distinction, it is clear that the motives for international educational activity can vary widely. Motivation can range from the desire to increase profit or revenue to goals intended to enhance global research and educational content, including cultural understanding. Altbach and Knight note a trend in branch campuses, students seeking overseas academic or cultural experiences, and cross-cultural experiences being added to the curriculum of many institutions (Altbach and Knight, 2007). This paper focuses on the educational, research, and cultural motivations for internationalization rather than money generation motivations. In addition, the paper treats globalization and internationalization as somewhat synonymous terms as was found to be common in much of the literature on the subject.

International employment challenges and opportunities for construction management graduates were noted well over a decade ago (Bodapati & Kay, 1998). The continued opportunity is detailed in table 4 of the World Bank International Comparison Program report. The report reveals that the US total actual expenditures for construction were only 15% of the global total in 2005 (World Bank, 2005). Engineering News Record's (ENR) list of top 225 firms shows a range of annual international contracts from \$152 million to nearly \$34 billion per company during 2011. Using the median value of \$900 million, it can be concluded that the top international construction firms contracted well over \$200 billion in work during that year (Tulacz, 2012). It has also been noted that US construction organizations are experiencing an influx of foreign born workers requiring construction managers to deal with issues involving a more diverse workforce (Lower & Shaurette, 2010). Growth of a global supply chain to stock construction projects at home and abroad has also been noted (Levitt, 2007).

Clearly, preparation for international employment opportunity, an increasingly global economy, and the need to manage a more international workforce are potential reasons to place emphasis on the international connections of

construction management programs. In response to this global economic opportunity, many programs now offer courses that provide an introduction to international management, engineering, and construction issues. As an example, Purdue University, in an attempt to provide global understanding across the full range of degrees offered, has included 'Global Citizenship and Social Awareness' as an imbedded outcome expected of the undergraduate core curriculum (Purdue University 2013a).

As the global economy has expanded, universities have expressed a general desire for global experiences in the educational process. Global experiences include internationalizing the curriculum, recruiting international faculty and students, promoting study abroad, as well as building international communities, outreach collaborations, research, and more. Some of the early attempts to provide global experiences could be interpreted as more 'isolationist' because they did not promote true partnerships. Rather, the international collaborators were expected to totally conform to the host institutions language, culture, and practices with little or no accommodation for the challenges experienced by visiting collaborators. Other early attempts were based on a desire to help international partners but approached the process from more of a 'colonialist view'. The colonialist view operated from the assumption that what had been working in their culture would be equally effective in another culture. A more desirable approach is the move to a 'post-colonial' approach that can result in mutual transformation. Some examples include global opportunities for faculty development and participation in international service learning projects involving faculty and many levels of student participation (DeZure et al., 2012).

## Literature Review

Around the world there are notable similarities in the educational challenges to internationalizing teaching and learning in higher education (DeZure et al., 2012). Some of the challenges noted in the literature include resistance to change, time constraints, inflexible or incompatible reward systems, constraints created when working across geographic boundaries, limits to the use of active learning, limitations and continual changes in instructional technology, a diversity of views on and application of assessment, as well as limited international accreditation. Despite these significant challenges, the literature indicates a growing acknowledgement that global competencies should be introduced in higher education.

The engineering curriculum is one area where the changes necessary to prepare students for future global interaction have been examined in detail. The need for global experience was one of eight objectives for curriculum change that came from a 2011 survey of over 3000 individuals followed by discussion at conference sessions during the American Society for Engineering Education (ASEE) 2012 annual conference (Meckl et al., 2012). One issue that came to light during the ASEE conference sessions was the need to better define global competence. A recent dissertation examining the global competency needs of industry included a literature review identifying the following categories of engineering global competence (Warnick, 2010).

1. Exhibit a global mindset
2. Appreciate and understand different cultures
3. Demonstrate world and local knowledge
4. Communicate cross-culturally
5. Speak more than one language including English
6. Understand international business, law, and technical elements
7. Live and work in a transnational engineering environment
8. Work in international teams

Research is another area where global challenges are referenced in the literature. Raymond Levitt noted that construction engineering research in the last 50 years emphasized the construction process with little consideration for the social impact of the project or what happens to the resulting built environment after the hard work of reducing the first cost of the building was completed. The realization that facility maintenance needs and the total life cycle cost of the building are globally important has transformed construction research and construction activity as sustainable principles are being applied. Because the societal impacts of sustainable design and construction are global, research on how global firms can share lessons learned through collaborations can have an impact in multiple countries (Levitt, 2007). Research collaborations between international construction companies and researchers can be very beneficial because a multiplier effect is realized when collaborations include many universities and cultures (DeZure et al., 2012).

Reduction in energy and carbon production is a major outcome of sustainable design and construction principles. Unfortunately there are many signs that these principles are not being utilized in wide enough application. One example can be seen in the European Union (EU). The EU imposed strict mandates on carbon reduction with goals set for the years 2020 and more stringent goals for 2050. A recent report to the European Parliament pointed out that progress toward meeting the mandates of a 20% improvement in energy efficiency by 2020 is behind schedule. The report notes there is a need to mobilize resources to meet the goals, to develop an integrated approach to the process, to increase the use of energy audits, to train the needed professional, as well as to share and disseminate the best practices required to meet the goals (Turmes, 2012). In this important area of global concern, there is also an educational need for the teaching of communication skills. In energy efficiency projects, middle managers must develop and implement their own level of strategy rather than depending on upper management strategy alone. Middle managers must draw on the context of the project, not just the issue specific competencies of energy related construction, to influence stakeholders and get their commitment. As a result, middle managers working on energy efficiency projects need to know how and when to share information as well as how to develop networks that support teamwork within the global context of the project (Ludvig et al., 2013).

### **Potential International Educational & Collaborative Experiences**

Table 1 includes a list of potential international educational and collaborative experiences that have been suggested to promote global competencies along with source citations available for additional detail. The expected outcomes included are general in nature, are by no means exhaustive, and have been included as rough guidance only. Several of the international experiences from the table that are more widely utilized or which provide collaborative opportunities with the potential for continuing global activity are examined in more detail in the following paragraphs.

Many successful study abroad experiences which provided value to the participating students have been described in the literature. In one case, a five week study abroad experience is the basis for completion of a construction related undergraduate thesis (Liu & Kramer, 2010). Another included both classroom instruction before the study abroad experience and completion of a related paper at the conclusion (Lopez del Puerto & Gordon, 2010). An additional example of study abroad combined the end of degree capstone project with visits to international construction projects, culminating in both written and oral reports submitted to a faculty jury (Kramer, 2004). The study abroad experience is considered to be so advantageous to graduates that in 2013 Purdue University chose to provide scholarships of up to \$3,000 per student for participation in a semester long credit bearing study abroad experience (Purdue, 2013b).

Sabbatical leaves have long been a source of professional development for university faculty. Sabbaticals are typically used for teaching at another university, research activities or advanced study by the faculty member. Universities around the globe are open to facilitating sabbatical visits. These visits can promote international experience or collaboration. Unfortunately, these overseas opportunities may be avoided by some because of the challenges presented by conflicting schedules of family or the interference of professional issues (Gehrig, 1992). Some have a concern that international sabbatical funding in future university budgets may be limited because of political opposition to support for activities that do not immediately benefit the state. Nevertheless, when circumstances allow, international sabbatical activities can lead to long-term opportunities for global collaboration.

International partnerships to develop updated programs or faculty development create conditions with multiple benefits. For example, a partnership between the University of Hartford (UH) in West Hartford, Connecticut, USA, and Herat University (HU) in Herat City, Afghanistan was initiated in August 2007 to modernize engineering and architecture programs at Herat University. A variety of collaborative activities were used in both the US and Afghanistan programs. These activities included provision for faculty to receive advanced degrees, shadowing opportunities for observation of instruction and administration across programs, curriculum and course development, co-teaching opportunities, program enhancements, and research (Keshawar et al., 2012).

International co-teaching can provide opportunities for student cross-cultural experiences, faculty development, course development, and curriculum updates. Sharing teaching responsibilities can take many forms. Using a lead and support structure, one faculty member takes the lead while the co-teacher provides support for individuals or

small groups. With station teaching, students are divided into groups supported by different members of the teaching team who each teach a different portion of the content. In parallel teaching both instructors plan the instruction and teach different groups the same material. Alternative teaching allows a co-teacher to pre-teach, re-teach, supplement, or enrich instruction. Finally, team teaching can be used where both instructors are involved in planning, administration, and delivery of material as well as jointly participating in class activities. Collaborative team teaching gives instructors equal opportunity to share responsibility for teaching and learning. Lewis and Sincan describe the use of team teaching for a distance MS program in Medical Informatics. They found team teaching through distance delivery to be a successful method for international educators even though they were separated by significant distances. (Lewis & Sincan, 2009).

Table 1

***Potential International Educational and Collaborative Activities***

<b>Brief Description of Activity</b>	<b>Expected Outcome</b>	<b>Literature Source</b>
Include global impact in class projects	Global Learning Cross-culture	Meckl et al., 2012
Utilize technology to travel: use virtual travel	Global Learning Cross-culture	Meckl et al., 2012
Form teams on projects to allow for cultural exchange	Global Learning Cross-culture	Meckl et al., 2012
Make it easier/less expensive to study abroad	Global Learning Cross-culture	Meckl et al., 2012 Purdue, 2013b
Define and assess global competency	Global Learning Assessment	Meckl et al., 2012
Articulation agreements with international institutions	Global Learning Cross-culture	Meckl et al., 2012
International student internships	Global Learning Cross-culture	Warnick, 2011
Study-abroad programs	Global Learning Cross-culture	Warnick, 2011 Liu & Kramer, 2010
Faculty-led courses while on international travel	Global Learning Cross-culture	Warnick, 2011
Research experiences	Research Global Learning	Warnick, 2011
Language study	Global Learning Cross-culture	Warnick, 2011
International sabbatical leaves	Faculty Development Collaboration	Gehrig, 1992
International partnerships	Curriculum Devel. Research	Keshawarz et al., 2012
Interactive international co-teaching	Course Devel. Cross-cultural	Lewis & Sincan, 2009 Meckl et al., 2012

**Recent Application of International Collaborative Activity**

The author was recently involved in an international experience through a semester in Dublin Ireland supported by the Fulbright Scholar Program. The Fulbright Program began in 1946 through a bill introduced in the US Congress by Senator J. William Fulbright. The stated goals of the program include providing an “opportunity to observe one another’s political, economic and cultural institutions, exchange ideas, and embark on joint ventures of importance to the general welfare of the world's inhabitants”. These goals reveal the Fulbright Program to be an excellent example of a global collaborative activity. Since its inception, the program has supported an exchange of over

300,000 US and international scholars. In 2012, support was provided for approximately 8000 scholars for study, lectures, research and teaching in 155 countries (Fulbright Program, 2013).

Although not part of a faculty sabbatical, the author's Fulbright experience shared many of the advantages and challenges common to an international sabbatical. It enabled the author to expand his knowledge of the host location, educational systems, and construction technologies. Exposure to the diversity of cultural, regulatory, and public policy issues in the host country was also of value. Despite the plethora of benefits that can result from the experience, the challenges involved in the implementation of an international visit can limit their use. The logistics of the process may prevent many faculty members from participating. It is likely to require the faculty member to relocate to another country, incurring additional housing costs in the host country while maintaining their residence in the US. Working spouses, continuity of children's education, language barriers, potential safety concerns, and the inconvenience of a temporary relocation may make an overseas stay unpalatable to many. The source of financial support during the time abroad may also be a stumbling block. The cost of employing the faculty member may have to be shared in some way. Even though the complication of disrupted continuity of schooling for children was not a factor in this case, the author's wife needed to suspend much of the work of her consulting business in order to participate in the overseas trip. Despite this and other obstacles, the experience was highly successful and justified any sacrifice necessary to complete the arrangements.

The semester in Dublin consisted of research, teaching, and outside lecture opportunities. In the end, considerably more learning took place than teaching. The primary research conducted was a comparison between the technical and public policy issues that arise when attempting to improve the energy efficiency of the built environment in the US as compared to Ireland and the UK. The research was a personal and small scale research activity in comparison to the work of the International Council for Research and Innovation in Building and Construction (CIB) Task Group 66, Energy and the Built Environment. Task Group 66 used novel working methods to collaboratively review implementation of energy efficient building policies in seven developed countries (United States, Canada, Germany, Belgium, France, the Netherlands and Poland), and nine emerging countries (China, India, South Africa, Argentina, Brazil, Chile, Mexico, Uruguay and Venezuela). They made use of top down meetings conducted through internet seminars rather than conferences. Employing 30 experts from a diverse background in university research, private industry, and public sector organizations, they made their deliberations as well as a comprehensive report freely available online. Their work allowed open dialogue between developed and developing nations and promoted rapid dissemination of international benchmarks for energy conservation in the built environment (Carassus, 2013). The work of Task Group 66 is an example of the collaborative possibilities offered by internet seminars or web conferences, while the author's experience shows the potential of a more individual and face-to-face collaboration.

Many classroom resources resulted from the author's Fulbright visit to Dublin. The author was able to provide new content for a graduate level course titled "Energy Efficient Building Retrofit" and planned a collaborative course with his contact at the Dublin Institute of Technology (DIT) to help Master of Science students at both universities become better prepared for their thesis research. The course titled "Construction Research Fundamentals" was to be co-taught and administered through a videoconferencing connection between classrooms in each university. The first offering of the course was not able to utilize co-teaching due to the DIT faculty member's illness. Additional contacts are being made at DIT to allow the course to be co-taught in the future.

The Fulbright visit also provided valuable interaction with multiple Irish scholars, organizations, and industry representatives. These contacts were instrumental in facilitating the completion of a chapter on policy challenges needed to promote energy conservation for the existing built environment. The resulting textbook, "Understanding the Global Energy Crisis" is scheduled to be published in 2014.

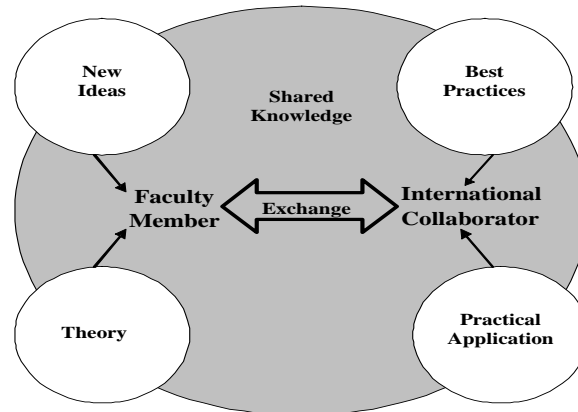


Figure 1: Mutual Benefits from International Collaboration

The author's Dublin experience demonstrates many of the benefits which can be achieved through international collaboration. The professional benefits that accrued will naturally flow to the students and peers who interact with him in the future. By bridging the gap between nations and cultures many of the mutual benefits of an international collaboration are displayed in Figure 1. This figure was adapted from Hynds (2000) who used a similar diagram to describe the benefits of a faculty internship experience.

### International Collaboration Planning Tips

Based on the author's international experience and suggestions obtained from literature on the subject, the following best practices are suggested for international collaboration:

- Begin any collaboration with a physical visit if possible (Keshawarz et al., 2012). Nothing can replace personally experiencing the full context in which other cultures must operate.
- Personal connections with global collaborators can be a first step in a successful working relationship (Keshawarz et al., 2012). These personal connections will open the door to wider opportunities and collaborations.
- Stay connected and maintain flexibility with international contacts to sustain the collaboration and promote future interaction (DeZure et al., 2012; Keshawarz et al., 2012). Parties involved in the international collaboration should maintain contact in order to realize the full long-term benefits of the relationships built during the experience. A global experience that ends after a single collaboration has not obtained the full benefits possible.
- There is a need for clarity in any collaborative partnership (DeZure et al., 2012). Communications are not always clearly articulated. Communications across cultures adds complexity to this challenge.
- In order to establish the most beneficial international collaboration, there is a need to learn about the educational, industry, cultural, and political systems of collaborating countries (DeZure et al., 2012).
- Conceptualize and plan for mutual benefits. This will help to avoid a 'colonialist' mindset where one collaborator seeks to help the other while missing the opportunity to learn from other groups, cultures or situations (DeZure et al., 2012).
- Team teaching requires self knowledge of strengths and weaknesses, a good understanding of your teaching partner's strengths and weaknesses, delivery based on the needs of the students, and a firm grasp of the material being presented (Lewis & Sincan, 2009).
- Open and honest feedback between co-teachers built on the basis of collegiality can help to promote course improvement while building parity, respect, and trust (Lewis & Sincan, 2009).
- Cultural differences between instructors and students can create challenges. These challenges can be worked out over time by acknowledging the difficulty through open constructive discussion (Lewis & Sincan, 2009).
- More widespread collaborative opportunities are possible through internet classes and internet seminars or web conferences than can be accomplished through face-to-face experiences. Technology enabled collaboration should be used to supplement conference and classroom activities in order to enhance global interaction.

- Establish expectations of the international experience ahead of time. All parties should be aware of these expectations so that they can work together in a way that provides benefits to all. This could be done with a written document or a meeting of all parties early in the planning process.
- If project visits are involved in international visits, review timing and accessibility issues. Lack of advanced travel planning that leads to a visit where appropriate work activities are not taking place may nullify the benefits of the project visit.
- Lines of communication should remain open among all parties during the international activity. Conditions may change that require some flexibility or a dramatic change in plans. Without open lines of communication, valuable opportunities can be missed.
- Creating a written document at the conclusion of the international collaboration that outlines the process, successes, failures, and outcomes of the experience can be helpful in planning for future global activities.

## Conclusion

International collaboration can be a valuable experience for both the participants in the activity and those that work with the collaborators in the future. Not only will the new knowledge obtained from global interactions be available for research and teaching, it can also result in a change of attitudes about teaching and learning in higher education (DeZure et al., 2012). Continued long-term global connections should be encouraged to promote a multiplier effect as additional contacts are made and maintained. Students, faculty, and administrators all have opportunities to participate in the internationalization of higher education in construction management. Based on the material obtained from recent literature, the personal experience of the author, and specific examples where global interaction influenced the sharing of knowledge across borders, it can be concluded that international collaborations of many kinds should be pursued when possible. Costs and challenges may present impediments to successful international collaboration. Because the benefits of international collaboration are significant, creative solutions to implementation challenges for individual situations are justified. The best practices that have been suggested to help guide global collaborations may help minimize some challenges and encourage future CM faculty to participate.

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