



Experiences Developing International Partnerships for Education and Research in Computing

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Abstract

Over the past few years, we have been working to develop international partnerships in computing between our institution in the United States and peer departments in Colombia, Peru, Ireland, and Norway. Over this period of time, based on our experiences we have developed a process for developing and deepening strategic partnerships in computing and information technology. The approach we have developed involves several stages that begins with an initial meeting at a conference or workshop (usually at an international venue) in which both sides determine that there are several areas of overlapping interest and problems affecting both groups in the unique context of their institution, government and culture. These problems often have a common root cause and solution that motivate further discussion and joint problem-solving activities. This initial contact can lead to identification of opportunities on either side that can be enhanced by leveraging a strategic partnership from one institution to another. The efforts put into developing joint activities that are mutually beneficial can establish a track record of prior and preliminary work that can be built upon in an incremental fashion to develop a joint education and research program that is mutually beneficial to the faculty, students, and institutions.

In this paper, we describe our experiences in exploring and developing these partnerships, and describe a process we have learned through experience that have led to funded activities. We believe the experiences described in this paper will be useful and interesting to others seeking to develop and deepen international partnerships with peer departments and institutions.

1 Introduction

International partnerships are frequently proposed, but many never make it beyond an expression of mutual interest. The challenges to overcome are initiating first contact, discussing research areas to determine if there are overlapping areas or topics of mutual interest, seeking out and pursuing visiting and funding opportunities, and loss of initial momentum.

To overcome these challenges, we have developed a process for building and strengthening international partnerships in computing and information technology.

2 Our Approach

Our approach consists of three primary stages:

1. Making contact
2. Fostering the relationship
3. Maintaining the relationship

2.1 Making Contact

There are several variations of international partnerships—University-backed and initiated, faculty-initiated, and industry-initiated. Each of these has their own advantages and disadvantages, and some require more energy to build and maintain. Regardless of the type of partnership, contact must be made between institutions, but first, an institution with a compatible vision and goals is necessary.

2.1.1 Finding the right partner

The most important factor when seeking international partnerships is finding the right partner. All participants must be fully aware of their current and desired identity as an institution. Participants must have clear objectives and goals, in addition to being aware of what their institution and personnel have to offer. The best partners are those with common institutional goals and complementary core competencies across departments or colleges. For example, TECSUP, the authors' partner in Peru, is a nonprofit, private institution founded in 1982, whose mission of practical technology education is similar to the authors' own land-grant university mission.

2.1.2 University-backed and initiated partnerships

University-backed partnerships are often a top-down directive or an encouragement from a university's administration for the faculty to work on developing a partnership with a chosen institution. It is much easier to gain support and funding for from university administration for these partnerships, and the university has already "pre-screened" the prospective partner institution's goals, benefits, and needs. Internal university funds may be available to support the initial stages of building a partnership. However, because the university has already chosen a partner and defined a vision, faculty may be limited in the types of topics and activities that they can pursue.

The authors' affiliated institution initiated a partnership with peer institutions in Colombia and Peru. They were selected from a group of potential institutions for the purpose of fostering a strategic partnership within a target country.

2.1.3 Faculty-initiated partnerships

Faculty-initiated partnerships often start with discussions with other faculty at a conference or through a cross-institution visit and have several advantages. Faculty-initiated partnerships generally have much more flexibility about the pace of development, the topics and subject matter, among other things. These partnerships also allow for partners that were previously

unconsidered by the university's administration; however, these types of partnerships can be more difficult to form due to reluctance from the administration regarding funding and other support.

Faculty-initiated partnerships often require funding from public or private agencies in the home country of one or both of the peer institutions.

The authors are currently fostering a faculty-initiated partnership with a peer institution in Norway after faculty from both institutions met at a high performance computing conference. This partnership is in its early stages and is currently being supported through funding from the government of Norway.

2.1.4 Partnerships with industry

The third type of partnership is one with industry. This occurs when a partnership between academic and industrial institutions is initiated to achieve mutual goals. These types of partnerships are special in that there is more freedom in determining what activities take place between institutions because of the private nature of industry organizations.

The authors' institution recently established a student-initiated relationship with Facebook after a student attended an Open Compute conference.

2.2 Fostering the Relationship

Fostering the partnership is the most difficult part of the process and begins after the first contact is made with a peer institution. This stage requires enthusiasm and effort by all involved parties to be successful. In order to maintain the momentum from a successful first contact, a second substantial contact must happen within one month; otherwise, the prospective peers from either institution will lose interest or relegate the development of the relationship to a very low priority. This is especially important for faculty-initiated partnerships which do not yet have institutional backing from all involved parties.

In one instance, an author was discussing a potential partnership with a faculty member at another institution, and the other institution's faculty member agreed to make contact after the conference. Contact was next made four to six weeks later, and the other institution's faculty member had forgotten what the partnership was for and whom it was with. No further contact was made.

While the eventual goal of an international partnership is a long-term joint education and research program between peer institutions, building these programs takes time. To maintain momentum in the early stages of the relationship, small research and education exchanges are necessary. These may include guest lectures or short faculty exchanges, short study abroad courses, joint academic papers, or joint student projects. These can often be put in place quickly with a minimum of administrative approval, build personal and professional relationships between faculty members from peer institutions, and serve as a basis for building a more extensive partnership. Further opportunities as well as challenges in building the long-term partnership are identified during this period.²

3 Our Experiences and Outcomes

Through this process, the authors have built successful or promising international partnerships with institutions in Norway, Peru, Ireland, Spain, and Colombia.

3.1 Norway

The budding partnership with an institution in Norway—the University of Stavanger—is a faculty-initiated partnership during an international conference. Initial exchange began with a visiting scholar from Norway, followed by significant funding from the Norwegian government to support the partnership.

The formal collaboration began with a two day intensive “kick-off workshop” at the University of Stavanger, where all faculty participants met face-to-face to discuss the short and long-term goals of the partnership. This highly successful meeting enabled the faculty partners to build working relationships, create an action plan, and establish goals and timelines. Over the course of the workshop, several challenges were identified, including mismatches in academic calendars, differences in the structure of graduate advising and defense committees, and course credit requirements. Several additional collaborative opportunities were also identified, including research collaborations, and work on a jointly authored textbook.

For this collaboration, the initial face-to-face meeting was an excellent way to establish momentum and identify immediate opportunities. Regular meetings of the faculty from both institutions are building the relationship, and the partners are able to move forward on the initial small exchanges while addressing the longer term challenges for the future.

Within the first year of this collaboration, the authors have established a graduate level short course in high performance computing, which will be held for the first time in Stavanger during the summer of 2013. This will serve as the basis for a longer, semester-length joint course, with credit granted to students from both institutions. Further goals of the partnership include joint advising of graduate students, semester length student exchange, and faculty research and teaching exchange through guest lectures, visits, and joint workshops.

3.2 Peru

The authors’ partnership with TECSUP in Peru is the most mature of the set and was initiated in 2007 with student exchanges beginning in 2009. Two papers were submitted within 45 days of returning from Peru, with the first being submitted 10 days after returning. The partnership began with five consecutive spring semesters, a collaborative two week program involving faculty and students from both institutions was delivered in Lima.

This has matured to a program consisting of students from the authors’ institution traveling to TECSUP’s main campus in Lima, Peru during odd-numbered years, and during even-numbered years, students from the authors’ institution travel to TECSUP’s satellite campus in Arequipa, Peru. Every year since 2009, students from each institution travel to their peer institution’s campus for a two week series of mini-courses and seminars covering a wide variety of topics in

information technology. The authors' institution has sent an average of nine students every year to TECSUP, and TECSUP has sent an average of 10 students every year to the authors' institution. Due to limited laboratory space at TECSUP, the authors' institution is able to send 12 students at most.

TECSUP offers a three year degree program, which does not qualify as a bachelor's degree per World Education Services³, but the authors are working with TECSUP to develop an articulation agreement so that Peruvian students who finish the program at TECSUP can enroll at the authors' institution and get a bachelor's degree from the authors' department.

3.3 Ireland and Spain

The authors' institution is part of a three-way partnership with peer institutions in Ireland—the Dublin Institute of Technology—and Spain—Universitat Politècnica de Catalunya—which is built on the idea of sustainability of innovation. The authors' partnership with DIT began with a visit from DIT faculty to our department, followed by a visit from several faculty from our department to DIT. One faculty member has taught a summer course for one month. During this time, several faculty from our department visited DIT during that time, sharing the apartment accommodations.

As a result of this partnership, graduate students from the authors' institution take a year's worth of courses at the authors' institution and then 1 semester each at both peer institutions. Students are then eligible for two master's degrees—one from the authors' institution and one from either of the two peer institutions. This partnership has also resulted in joint advising of students and a visiting scholar from DIT.

3.4 Colombia

A group of faculty from the authors' institution visited several institutions in Medellín, Bogotá, and Cali. During these visits, we visited with faculty at each institution. Some of these visits were preceded by a video conference to allow us to conduct early explorations of our research areas to determine overlapping areas of mutual interest. In our initial discussions, we discovered a mutual interest in the development of hubs for earthquake engineering based on the NEEShub.¹ As a result, our department has a new graduate student from Universidad EAFIT, and another graduate student is planning to spend a semester as a visiting scholar.

3.5 Facebook

The authors' institution is part of a partnership with Facebook. This partnership was initiated by a graduate student attending an Open Compute conference, at which mutual interests were expressed. After the conference, the student reached out to Facebook to further pursue a potential partnership. Representatives from the authors' institution and from Facebook participated in several conference calls, which led to Facebook representatives visiting the authors' institution to further the relationship. One year after the conference, the authors' institution has received major gifts from Facebook, and a graduate level course has been developed focusing on innovation in the data center. Facebook gifted the authors' institution

with money and 300 servers to support research, with more donated servers expected in the future.

3.6 Challenges of International Partnerships

There are many challenges to building and maintaining successful international partnerships. Challenges range from cultural and logistical to organizational and political, such as lack of administrative or institutional backing and funding.

Cultural and logistical challenges pose significant problems. For example, in 2011, two students from TECSUP were able to obtain travel visas and were unable to participate in the student exchange program. Because many students at European institutions do not pay tuition, the authors' institution has to waive tuition for European students, which requires significant university support and administrative effort. Course schedules and academic calendars can cause issues when students' schedules do not properly align with student exchange schedules. Additionally, institutions must negotiate accreditation of courses between institutions.

Finally, a major threat to ongoing relationships is a lack of large-scale and long-term administrative support for these international partnerships. The authors' partnership with TECSUP has been losing support from the institution's administration, despite substantial support from faculty and students. This is in part due to financial maturity, as well as shifting priorities from college-level administration. This is to be expected as part of the maturation process of both the relationship and of universities. As funding disappears, institutions must quickly be able to transition to self-sufficiency without passing too much of the cost on to the students, which would deter student involvement.

4 Conclusion

While there are many difficulties associated with building and maintaining successful and mutually beneficial international partnerships, the experiences and processes provided in this paper have been successful in overcoming these difficulties and resulted in funded activities and beneficial opportunities for faculty, students, and institutions. We believe that our experiences and observations could help other departments and institutions seeking to develop similar international partnerships.

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