

## **Evaluative Framework for International Collaboration**

Final Report prepared for the National Science Foundation

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### **Project Activities and Findings**

#### **Goals**

The evaluation research reported here had two central aims: To provide formative evaluation of two cases of international collaborations between U.S. and German doctoral programs and to use this experience to develop a framework for evaluation of international collaboration in doctoral-level science education that allows us to assess the benefits of such international collaborations to students, faculty and graduate programs. In the course of one year of a multi-method study we evaluated the international activities of two pairs of interdisciplinary science PhD programs in the U.S. and Germany that had established program-level international components. The guiding research questions were:

- What were the programs doing to foster international cooperation?
- What did faculty members, postdoctoral fellows, and graduate students expect from program-level international cooperation?
- How did faculty, postdocs and students experience participation in the international component of their doctoral programs?
- What were the hurdles for successful international cooperation? What were successful features of the international collaboration?

#### **Findings**

- Faculty, graduate students and postdocs shared many goals for the program-level collaboration. They expected to broaden their scientific and personal perception, to network with peers in the partner program and to expand career prospects.
- Successful features of the international collaboration included annual theme-based workshops that provided scholarly and social contacts over several days, an intense exchange of research findings, methods and new ideas. The fact that participants met again over a period of time allowed for increasing ease in communication and for networking beyond narrow individual research interests. The small format facilitated an easy mingling of students and faculty of different nationalities and reduced the influence of hierarchy of status and language.
- English language training enabled German students to participate more actively in the scholarly and personal conversations.
- Traveling and working together allowed for development of collegial relationships between students and faculty inside and across programs.
- Networking across status groups and national borders was one of the most valued outcomes of the collaboration.
- Hurdles for successful international cooperation were posed by structural and organizational problems like differences in structure of the academic year, curriculum and organization of the doctoral programs, funding of students, pressure to finish the degree fast.

- National stereotypes and a competitive attitude towards the partner program sometimes created tensions.
- And English as the common language disadvantaged almost all German participants not only those with poor command of English.

### **Evaluative Framework**

On the basis of the major findings of our evaluation research we designed an Evaluative Framework for the assessment of cross-national collaborations by doctoral programs seeking to add or improve international components. Objectives are to determine the effects of exposure during early stages of doctoral training to international networking and research on the capacity to work across national borders in a globalized science environment. The goal of cross-national collaboration would be to integrate doctoral students and postdoctoral fellows into an international community of scholars. We found several necessary components for the integration process to work to the benefit of graduate students, postdocs and faculty. The most important dimension is a learning environment that allows all members to become full participants in the international community. Other factors are common goals, expectations and values; a communication and information flow that guarantees equal access for all members; low level of competition or nationalism between programs and members; access of all members to resources regardless of gender, age or status; and reduction of organizational hurdles and restrictions. Our multi-method evaluation framework is organized along these dimensions.

## **I. RESEARCH ACTIVITIES**

### **1. Goals and Objectives**

The evaluation research reported here had two central aims: To provide formative evaluation of two cases of international collaborations between U.S. and German doctoral programs and to use this experience to develop a framework for evaluation of international collaboration in doctoral-level science education that allows us to assess the benefits of such international collaborations to students, faculty and graduate programs. Here we discuss the success of the formative evaluation and our observations about factors that facilitated and hindered the international collaboration. We then summarize the evaluation framework we are building on these experiences.

### **2. Research Activities**

During the one year (August 2004-September 2005) which this report covers, we evaluated the international activities of two pairs of science PhD programs in the U.S. and Germany that had established program-level international components. We proceeded in four steps: (1) we reviewed documents and literature, (2) we investigated goals and expectations of all involved groups, (3) we observed and assessed program activities for establishing international collaboration, and finally (4) on the basis of steps 1-3, we designed a conceptual framework for the evaluation of the international component of doctoral programs.

#### **2.1 Research Questions**

The guiding research questions were:

1. What did faculty members, postdoctoral fellows, and graduate students expect from program-level international cooperation?
2. What were the programs doing to foster international cooperation?
3. How did faculty, postdocs and students experience participation in the international component of their doctoral programs with regards to goals?
4. What were the hurdles for successful international cooperation?
5. What were successful features of the international collaboration?

We report the analysis regarding these questions under II. Findings.

## **2.2 Participating Programs**

Participating in the evaluation research are two urban ecology (UE) and two bioinformatics (BI) doctoral programs: (1) “Urban Ecology” IGERT located at the University of Washington and Graduiertenkolleg (GRAKO) “Stadtökologie” located at Humboldt University, Berlin, and (2) “Bioinformatics Graduate Program” IGERT at Boston University and Graduiertenkolleg “Dynamics and Evolution of Cellular and Macromolecular Processes” (Systems Biology) at Humboldt University. All programs involved have established innovative, interdisciplinary doctoral education curricula and are supported by the national science foundations of their countries – NSF and German Research Foundation (DFG), respectively.

## **2.3 Data Collection Methods**

This study applied mixed methods. Traditional ethnographic methods of participant observation and in-depth interviews, as well as newer focus group techniques were used to examine processes in context and to elicit participants’ perspectives. To capture perspectives from as many different groups as possible, all members of the doctoral programs were asked to participate through personal one-on-one interviews, focus group discussions, or be subjects of participant observation. We studied those cohorts of doctoral students who were enrolled in the programs at the time the international collaboration between the programs started. The number of doctoral students and postdocs from the selected cohorts varies from 11 to 18. In addition we included in the study core faculty involved in the international collaboration. Administrative staff of the programs was also included in the study in order to capture the additional administrative duties that come with close international collaboration. Observations, interviews and focus group meetings took place either on the participating program campuses (Seattle and Berlin) or at the meeting sites off-campus (conferences, workshops, fieldtrips, excursion, etc.).

### *2.3.1 Participant Observation*

Participant observation allowed us to observe the development of social relations. In order to observe these emerging relations in action, we participated in IGERT/GRAKO collaborative activities, including jointly organized conferences and workshops, training in skills for cross-national work, lectures of visiting researchers, and social events sponsored by the program pairs. We also conducted four workshops to share information and observations with participants.

### 2.3.2 *Ethnographic Interviews*

Ethnographic interviews provided insight into participants' expectations and their thoughts and feelings about the IGERT/GRAKO collaborations. Interviews were tape-recorded or detailed notes were taken. Research staff are fluent in both English and German, thus interviews were conducted in the language preferred by the interviewee. In this period we interviewed 30 out of a total of 55 students and seven out of ten postdoctoral fellows; 21 faculty, and three administrative staff.

### 2.3.3 *Focus Groups*

We conducted three focus groups with graduate students and faculty to get a broad picture on what worked and did not work in terms of gaining skills for and actual involvement in international collaboration. Focus groups were conducted in the most appropriate language for participants.

### 2.3.4 *Document Analysis*

Official records and documents were analyzed for perspectives on program activities and outcomes. Such documents included course catalogues, workshop agendas, written statements of program goals and institutional support, and personal correspondence between program participants.

### 2.3.5 *Protocols*

Protocols for the exploratory interviews and focus groups are documented in the appendix.

## 2.4 **Service**

CIRGE played a role in the initial conception of the collaboration between the two urban ecology programs in this study and was also involved in the general evaluation of the UE IGERT at UW. As another service to the program CIRGE offered ongoing observation of the international activities including occasional help with preparatory workshops, facilitation of group sessions and communication with the German counterpart. One fallout of these activities was the regular attendance of the CIRGE researcher of all joint ventures of both groups as part of this long-term evaluation plan to study the effectiveness of the international collaboration with respect to career outcomes and curriculum development. Traveling with the groups, attending all their activities, interviewing all participants, and occasionally facilitating group sessions has made the CIRGE researcher a frequent presence of that international group. Because of her special role – not being faculty and being a German living and working in the U.S.—the researcher became a quasi-confidant at several occasions for some participants who requested confidentiality concerning the content of the conversations. Feedback to faculty was given whenever the researcher thought it was needed to alert core faculty of both programs to communication or other collaboration issues; it was used sparingly. Feedback never disclosed information that was obtained in confidential interviews or conversations.

The role of CIRGE in the bioinformatics programs was less active, confined to attending joint workshops in order to conduct interviews and to do participant observations. We decided to add this second pair of collaborating doctoral programs to the study in order to create a larger data base for the evaluation of international collaborations on the program level. The two

bioinformatics programs had embarked on working closely together in very much the same fashion as the urban ecology programs. When CIRGE started attending their workshops they were just starting to add a third doctoral program to the collaboration, the Kyoto University Bioinformatics Center. During the report period CIRGE participated in three joint workshops (Kyoto, Seattle, Berlin).

The service roles of the CIRGE director and researcher can be described as facilitators, bridge builders, translators, and formative evaluation consultants.

## II. FINDINGS

The cases of collaboration studied reveal two different types of cross-national collaboration between doctoral programs that stem both from the origins of the collaboration and differences inherent in the disciplines. The Boston University Bio-informatics/Humboldt Universität Bio-systems partnership arose out of common research interests and pre-existing collaborations between core faculty. Accordingly, the bio-systems scientists focus on exchange of research methods and results. Core faculty emphasize research and program activities. The University of Washington Urban Ecology/Humboldt Universität Stadtökologie collaboration came about in response to a suggestion by the German Research Foundation (DFG). It is fueled by a strong common interests in the new, interdisciplinary field of urban ecology. The urban ecologists put an emphasis on networking and on understanding of foreign academic research cultures, with core faculty strongly encouraging group and social activities.

Profound differences exist between Urban Ecology and Bioinformatics programs that influence the extent to which course and research content can include an international component. UE deals with problems and research questions that can be local or global; concepts and theories of urban ecology differ from one country to the other, thus program curricula differ accordingly; despite its science focus, UE as a field, has many features of a social science discipline and uses, among others, social science research methods. A large part of the research in these programs relies on seasonal field research.

The University of Washington UE IGERT addresses how to manage metropolitan growth by simultaneously maximizing human well-being and minimizing impacts on ecosystems. The program looks specifically at the socioeconomic factors (i.e., demographics, organizations, political institutions, and technology) and human preferences that drive urban patterns and how these patterns affect ecological processes and cause ecological change. The Humboldt University GRAKO Stadtökologie studies the development and transfer of innovations in the field of plant based surface treatment technology, stream improvement, selected traffic structures, and human behavior in large cities. Both, the UE IGERT and the UE GRAKO, focus on how to integrate theory and practice and academic and industrial concerns.

Bioinformatics is strictly a combination of science disciplines. Research methods include computational modeling, experimental laboratory work, and mathematical theory. Differences between program emphases are mainly due to differences in the national and field specific scientific cultures and are often dependent on particularities of how the field developed in each national context.

The Boston University Bioinformatics IGERT seeks to educate doctoral students for leadership in the post-genomic era. The program provides interdisciplinary training in the science, engineering, medicine and ethics of cell biology. It focuses on the molecular biology

and physics of the cell, and emphasizes the use of advanced mathematics and computation as part of the armamentarium of the twenty first century biologist. The Humboldt University GRAKO Dynamics and Evolution of Cellular and Macromolecular Processes, has a similar emphasis as the BU IGERT and focuses on the dynamics of cellular reactions and transport processes, the dynamics and function of macromolecular structures and the study of genetic, regulatory and sensory networks.

The findings about different collaboration types, influencing factors and consequences for the collaboration are summarized in Table 1.

**Table 1: Types of Cross-national Collaboration**

	<b>Bioinformatics</b>	<b>Urban Ecology</b>
<i>Factors Impacting Collaboration Type</i>		
Origins of Collaboration	Pre-existing scientific relationships between PIs	Suggested by funding agency
Discipline Differences	Science	Science & social science
Object of Study	Molecular processes	Environmental consequences of social behavior
Methods of Study	Lab, computational, experimental	Field research, lab
Differences Between Programs	Historical, national	Object of study, national
<i>Consequences for Collaboration</i>		
Goals	Exchange of research methods and results, networking	Networking, cultural exchange. Establishment of new discipline.
Activities	Science focus	Communication, process & cultural focus
Organizational Structure	Joint planning committees for each event	Each program plans events separately
Organizational Challenges	Balance between research presentations and social activities	Timing of joint workshops due to different field research and course schedules

To report the findings of this evaluation study is complicated by the fact that we observed four programs grouped in two pairs. Some items were common to all or several of the programs, others applied only to one program or one of the pairs. In general, if no specific programs are mentioned, the reported findings pertain to all programs. In cases of program specific findings we name the individual program. Following rules of the UW Human Subjects Review Board we do not quote individual participants in this report.

## **1. What were the programs doing to foster international cooperation?**

### **1.1 Annual Workshops and Conferences**

Joint annual workshops and conferences of 4-7 days were the focal point of the program level activities. Workshop venues alternated between the programs. Formats differed slightly according to which program was responsible for the event. The UE programs organized their workshops and conferences locally with some input from their cooperation partners, while the BI programs selected a scientific committee with members from all programs to organize the workshop and to decide on papers and posters in a peer-review process. Additional standard features at all joint workshops or conferences were both formal and informal cultural and social events like sightseeing excursions, dinners, barbeques, bar visits or music events. Visits at research labs and research sites were common. All programs encouraged their students to participate in the joint workshops and accompanying social activities; in general they had adequate funds for student and faculty travel abroad.

### **1.2 Preparations for International Cooperation**

To prepare students and faculty for their trips to Germany the UW Urban Ecology IGERT conducted workshops recommended by CIRGE about the German political and educational system. The topics were (1) individual expectations re the upcoming visit; (2) differences in scientific and political cultures and their impact on relationships with the German colleagues; (3) the different university systems and scientific organizations in both countries; and (4) general country information. Facilitator of these workshops was the CIRGE researcher who is a German national with current knowledge about both countries.

During the workshops participants spoke about their expectations and concerns, their previous experiences with travel or study abroad, and about their knowledge and prejudices about the host country. For many students (and faculty) the trip to Germany was the first one to Europe or abroad altogether, while others had been traveling in Europe or Germany before. In general, the German students and faculty are more widely traveled but only a few of them had visited the U.S. before.

The preparatory workshops were very effective. According to participants they helped to better understand the educational system, provided an underpinning for otherwise confusing facts, and encouraged them to focus on their expectations and possible apprehensions in advance. The discussions also made the group aware of other members' prior experience and their feelings about going abroad, so that they could look out for each other better or utilize their prior

experience while traveling together. Likewise, an ad-hoc lecture by the CIRGE director and researcher during the first visit of the UE-Berlin group about the U.S. higher education system cleared many misconceptions. A good understanding of both systems, their similarities and subtle and not so subtle differences made it easier for the visitors to understand how system differences impact students, faculty and the research community.

### **1.3 Research Visits**

After the first contacts had been made several German students went for research visits of 3-12 weeks to the U.S. (BI Boston, UE Seattle and other cities) and participated also in the regular program activities at their host institutions. So far 12 students and postdocs went for research visits abroad.

The answer to the question: “Who benefits from these visits” depended on the visitors’ stage in his/her education. A beginning student usually benefited more than his/her hosts who invested often considerable time to integrate the guest without gaining much. In the case of a more accomplished student, the hosts would often benefit as much if the visitor was able to transfer program specific knowledge to the host program and to participate actively in their research. In some cases these visits have resulted in joint publications.

### **1.4 Exchange of Scholars**

A faculty member from Boston University lectured a special statistics course at Humboldt University. Two German faculty spent sabbaticals at their partner universities abroad.

### **1.5 Language Training**

To prepare for the joint workshops and the trip to the U.S. UE Berlin students organized and attended two week-long English workshops to practice the language and to learn about presenting and publishing in English.

## **2. What did faculty members, graduate students and postdoctoral fellows expect from program-level international cooperation?**

Programs tended to enter into international collaborations without spelling out their goals and expectations. The program administrators agreed that they wanted to provide an international forum for graduate students and young researchers where they can report recent progress, exchange new ideas and form networks. They did not operationalize these goals, which is why we initiated our research with an inquiry of goals and expectations. At this point we report first about program level goals, then faculty goals and expectations, and last student and postdoc goals and expectations.

### **2.1 Program Goals**

When the programs started they did not lay out a detailed concept of their international components. In their initial proposals or program descriptions international aspects were mentioned mainly with respect to content, prospective international experts, and student’s participation in international conferences (UE) or as one part of collaborative research (BI). Only

after closer collaborations on the program level had emerged and they applied for additional financial support did the Urban Ecology IGERT faculty spell out the envisioned short-term and long-term goals for the partnerships. (For a detailed account of goals, success indicators and progress report see appendix.) The other programs, in applying for additional funds or for renewal, merely described the planned activities and their costs without stating the goals or objectives, thus suggesting that it was understood that close international cooperation is beneficial to the programs and its students.

Faculty, student and postdocs goals and expectations are summarized in Table 2.

<b>Table 2: GOALS OF INTERNATIONAL COLLABORATION</b>		
<b>Faculty Goals &amp; Expectations w/regard to ...</b>		
<i>Graduate Students</i>	<i>Faculty</i>	<i>Programs</i>
Broaden perspectives Personal growth Networking Progress in studies Career development	Strengthen international networks International visibility Foster professional contacts Joint research projects	Curriculum revision Improve student-faculty relations Forge joint doctoral program Increase reputation of program Garner institutional support Advance emerging field
<b>Student Goals &amp; Expectations w/regard to ...</b>		
<i>Graduate Students</i>		<i>Programs</i>
Broadened perspectives Personal growth Networking Joint research projects Postdoc opportunities Improved language skills	(none)	Curriculum revision
<b>Postdoc Goals &amp; Expectations w/regard to ...</b>		
<i>Postdocs</i>		
Broadened perspectives	(none)	(none)

Personal growth Networking Expanded career prospects Improved language skills Cross-fertilization		
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## 2.2 Faculty Goals & Expectations

When asked in the initial interviews about their goals for the close collaboration with a partner program abroad, core faculty addressed three anticipated beneficiaries: (1) graduate students, (2) faculty, and (3) the programs. The following is a summary of articulated goals and expectations.

### 2.2.1 Faculty Goals for Their Students

For their students faculty expected a wide range of benefits: students will **broaden their perspective** on society and science by learning about different systems, new methods, and variable research approaches; the collaboration will contribute to **character formation** or personal growth as the students will better understand global matters and deepen their empathy for people and problems in other countries and will increase their ability to communicate; students will be **networking** with their peers abroad including forming long-term relations and building trust for future partnerships in research; students will make significant **progress in their studies** by including international perspectives and comparative data in dissertations and research papers; students will be better motivated because of a more interesting curriculum, incentives to set and achieve milestones, and the competition with their international peers; students will be able to practice presentations at international conferences; and they will have an opportunity to hone their language skills; ultimately, students' experience will contribute to their **career development** as an international perspective and experience is advantageous in job interviews, CVs, and in publishing; they will pick up on international developments faster than others; and they may foster contacts for future postdoc or professional appointments.

### 2.2.2 Faculty Goals for Themselves

For themselves faculty stressed how important **international networks** are in a globalized world. They expressed that new ideas are created through exchange and wanted to bounce off their ideas with colleagues abroad and learn innovative pedagogic concepts from their partners. For their own careers they wanted to **foster personal contacts** which are often necessary to succeed in a foreign country. Finally they anticipated **joint research projects** in which they could include their students as well.

### 2.2.3 Faculty Goals for Their Programs

For their PhD programs faculty anticipated multiple benefits: **curriculum** content would become more interdisciplinary and inclusive of international aspects; research questions, methods, concepts, and solutions would become more innovative; and once they exchanged teaching methods and teachers they would profit from that wider experience; **relations among students and faculty** would improve through the group travel and group experience; a **joint**

**doctoral program** or other forms of intense international collaboration could strengthen ones own emerging interdisciplinary field and increase the reputation of the program. International collaboration had in their minds become an important factor for **institutional support**. National funding agencies deem international components indispensable for financial support and renewal of innovative programs, and university support is likely to increase with prestigious international contacts.

U.S. and German faculty by and large shared these goals, but some German faculty additionally hoped German students would learn enough about U.S. academic life and culture to be influenced to stay in Germany instead of aspiring to a career abroad. Others wished the experience would reduce ignorant prejudices against Americans.

### 2.3 Student Goals & Expectations

In our first interviews with doctoral students we focused on their expectations and personal goals with respect to international activities during their graduate studies. Many of the expectations overlapped with those of faculty members, especially their interest in **networking** and their hopes for **personal growth** in terms of opening one's mind; learning other teaching and communication standards; overcoming prejudices and stereotypes; developing personal relations with foreign nationals; and traveling abroad as life experience. They hoped that learning from their partner programs' curriculum would **improve their own PhD program**. They also expected from traveling with both their peers and faculty that it would lead to better rapport and understanding. Students also mentioned **broadened scientific perspectives** and hoped to be able to establish **joint research projects** in the long run. Only a few students focused already on career aspects like **postdoc opportunities** or joint publications. **Practicing language skills** and the opportunity to present papers and posters in English were a very important goal for many of the German students. They stressed, with very few exceptions, that without fluency in English a career in the sciences is impossible as publications in international journals and presentations at national and international conferences and meetings tended to be in English.

### 2.4 Postdoc Goals & Expectations

Postdocs had a slightly more professional idea of the benefits for their personal careers and scholarly projects. When they talked about a **broader perspective** they hoped to integrate good ideas from the partner program or country into their own research and teaching; expected a two-way cross-fertilization of ideas; and thought of new methods and literature they would be exposed to. They planned to improve their **career prospects**: in knowing people and publishing with colleagues abroad they would increase their chances on the job market; they anticipated that international experience would look good on a CV; they hoped that international contacts could generate leads to job openings. When postdocs talked of **personal growth** they were prepared to "exit their comfort zone" with respect to values and language, they expected their thinking to change through intense relationships and deeper connections with colleagues from abroad.

## 3. How did faculty, students and postdocs experience participation in the international component of their doctoral programs with regard to goals?

Some of the listed goals and expectations can be achieved only in the long term; for others we can trace the outcomes already in a shorter time frame. As we are here reporting on the beginning of the collaboration with none of the dissertations yet completed, we are evaluating the progress regarding those goals that show shorter-term outcomes and that could be assessed with indicators accessible through interviews and participant observations, the main methods we applied during the first year. Here we focus on goals with traceable shorter-term outcomes that all groups –faculty, students and postdocs- have in common: Acquiring a broader perspective; networking; personal growth; and improvement of their doctoral programs. Each of these goals we divided into several sub-questions to assess progress during the first year.

### **3.1 Acquiring a broader perspective on scientific issues.**

#### *3.1.1 Did the programs provide opportunities to learn about other systems, new methods, different national and scientific cultures?*

Our findings indicate that all four selected programs engaged in a multitude of activities to foster international cooperation between students, postdocs and faculty. Our findings show that the opportunities to learn about other systems, new methods, and different national and scientific cultures were received with great openness. All participants were satisfied with the opportunities to travel abroad and to meet scholars from abroad. Being able to spend more than just one or two days with colleagues from a similar doctoral program allowed them to discuss research questions in a more comprehensive fashion and to come back to conversations over several days. Students and faculty met at least once a year and some were in contact between the meetings. They appreciated this continuity.

Participants who had traveled abroad before (especially if they had longer stays abroad during high school, undergraduate studies, or employment, especially if they had been to the host country) were the most satisfied and seemed to benefit in a more concrete way. They often knew what to expect and whom they wanted to meet; they were also more active in seeking out certain people they wanted to talk to or in approaching people they had not been introduced to.

For the students, postdocs and faculty who traveled abroad for the first time the fact that they were traveling as a group provided a safe environment. Several students conveyed they would not have traveled individually to the partner country, either because they were not very interested in or fearful of traveling abroad in general or because of apprehension towards this specific country (Germany or the U.S.). For them the group acted as a protective safeguard and faculty played a special role in giving guidance and as role models.

Graduate students reported benefiting from the wide angle of topics even if their special area of interest was not discussed. Several of them concurred with this statement of one student: “I am not only interested in my dissertation topic; my interest is much wider than that. Dissertation research unduly narrows your curiosity and the workshops for once open up your mind again to the broader issues of your field.” Each of the three bioinformatics programs have a different focal point of inquiry –one is more theoretical the two others are more inclined to apply mathematical models to different sets of data. Therefore the exchange between the scholars provided food for thought, big and small scale. Participants reported having come to

breakthroughs in discussions with peers and attributed this to the intensely creative atmosphere at the workshops.

### **3.2 Building scholarly networks with students, postdocs and faculty abroad.**

#### *3.2.1 From student, postdoc, and faculty viewpoints, were the program activities helping to network with students, postdocs, and faculty abroad?*

Most participants were enthusiastic about the international ties emerging from the partnerships. This is true in spite of the fact that only very few students and postdocs found matching research projects already under way. But almost everybody was able to make contact with participants working in the same or neighboring fields to discuss research issues. Again and again, students, postdocs, and faculty emphasized that they were not only interested in their current research topic but other topics as well. They expected that at a later time in their careers it could be useful to know somebody who is an expert in a topic they might become interested in or that would compliment their own research. This is of course also an effect of the interdisciplinary composition of all four programs - intense discussions across disciplines have become almost daily routines for these scholars; they were now complemented by additional input from scholars from abroad.

One factor mentioned frequently as very important was the small format of these meetings. The size allowed almost everybody to interact with everybody without formal introduction. Students especially were appreciative that faculty – their own and from the partner programs- were accessible and easy for students to approach. Some faculty stressed that over time they got to know faculty from abroad personally, something they deemed necessary in the international realm where connections often play a bigger role in being recognized than nationally. Not all faculty members were confident that their own range of influence or effectiveness was increased by the meetings because their research is far outside of the realm of the research topics discussed. But they saw nonetheless a positive impact on their students' professional development. One other networking result was students' opportunity to connect with PIs from abroad for potential postdoc appointments and postdocs connecting with faculty for research jobs abroad. In some cases they even got leads from faculty to PIs at other institutions abroad with matching research projects who might be interested in the candidates' expertise.

#### *3.2.2 Did programs utilize IT networking tools to support contact with participants abroad?*

All programs had websites where they posted workshop programs, proceedings, photos, and a list of participants. None of these web sites is interactively accessible for the partner students. Early on UE students discussed the advantages of a trans-national internet chat room, but it was not established. Equally, suggestions by UE students of making available on the web site workshop/conference posters and CVs in advance of the meetings were applauded but not followed up upon. Video conferencing as a means of communicating between workshops was another item discussed by core UE faculty of both countries but not realized. Faculty communicated by e-mail mostly one-on-one or among a small group of people in charge. Student communication was also mostly one-on-one, rarely including all students.

### *3.2.3 Were the programs effective in trust building in order to prepare for joint research projects?*

Building of trust was one goal that was repeatedly mentioned by students and faculty as crucial before joint research could be attempted. A common assumption among students was that research would follow good personal relations and that good personal relations were essential for joint research. Interestingly, most non-work related conversations and contacts followed after research-related topics first dominated the conversations. Common interest in a research subject often triggered interest in the person(s) involved and lead to exchanges about other personal, political or social issues.

In contrast to the students, most faculty assumed that personal contact followed research. They alluded to their experiences with previous research or publications when friendships had grown out of a mutual interest in and work on a research problem. They believed that trust was built by actually working together. At the beginning, several German students, and a few U.S. students as well, were (and some remained) skeptical whether they should even consider trips abroad or joint research projects. These students were mainly concerned to fall behind with their dissertation research considering the tight schedule according to their stipends. But also large distances, presupposed different working styles, and limited knowledge of partners' work 'ethic' were factors for being less than enthused about the prospects of the international collaboration. In a few cases German students, after the joint workshops, asked their U.S. peers to review drafts of presentations or articles they had to deliver in English. All of them were surprised and deeply appreciative about the generous and thoughtful support they got from their American peers.

Several longer-term projects are in the process of being planned or accomplished. Three UE faculty from Berlin and Seattle are developing a comparative regional planning study in both countries. The German faculty of this joint project is planning to spend his sabbatical in 2006 in Seattle. UE core faculty from both countries -after discussing the lack of basic international literature in their budding new field- have compiled a book of basic texts by urban ecologists from both countries. Work was completed in August 2005; publication is scheduled for 2006. One UE Berlin student is planning a joint project on comparative bird data with a faculty member and a student from Seattle. One UE core faculty will become co-PI of the Berlin GRAKO in 2006 with the prospect of hiring a postdoctoral fellow and doing research together with a German faculty member and several students.

We observed a difference between German and U.S. participants. U.S. faculty and students tended to be somewhat more active in approaching their peers and/or non-peers. Whether this is due to language issues or cultural differences (or other factors) is impossible for us to discern at this point.

## **3.3 Contributing to personal growth through traveling abroad and cooperating with foreign nationals.**

### *3.3.1 Did programs support participants in understanding cultural and political differences?*

An important role for mingling of the host group and the visitors played early group activities as part of the workshops like small group discussions or sightseeing excursions and opportunities to immerse oneself in things outside of academe, like art, culture or entertainment. Participants deemed meetings the most satisfying if host students and faculty spent a lot of time

with the visiting group, especially outside of workshop activities. For this reason a venue away from the home town of the hosts sometimes was deemed most beneficial by both hosts and visitors, because everybody's sole occupation was to participate in joint activities, nobody had to attend to "business as usual." If host students and faculty made time to be with their guests a lot and even let them be part of their research life (visits to field sites, labs, seminars) or their private lives (family dinner, private stay, communal breakfast at home), visits were considered very successful.

### *3.3.2 How did participants describe the personal gain after travel abroad and group encounters?*

Students stated a wider view of self, of their field, of the visited country, of their peers and faculty. Some of those who had not been abroad before said that they gained self-confidence and a better understanding of their own culture and politics as they were constantly comparing the two systems. Those who were widely traveled stressed the contacts they made that were both scholarly and personal and hoped to maintain them in the future.

In the beginning a large number of German UE students and some faculty were, for several reasons, skeptical of the international partnership. They were afraid that the additional burden that comes with traveling and hosting would take away too much time from their dissertation research; they anticipated that an international component on top of the interdisciplinary approach would add a confusing or just too demanding extension to their program requirements; they did not see what they would benefit if no joint research projects were possible because none of their peers was working on a topic close to their own; or they were more interested in international ties with other, more 'exotic' or Third World countries than with a U.S. university. Views have changed considerably, although some of the concerns turned out to be valid. Participants reported, in addition to a gain in scholarly insights and the networking, that they had formed unexpected deep friendships; that they had learned that "people there are much more different from each other than expected and not so different from us"; and that they now understood that their stereotypes were not necessarily based on facts. Students and faculty from both countries expressed a new-found appreciation for their own programs or countries that they had gained by comparison with their hosts'. Some spoke about a new curiosity for the partner country that caused them to consider going back there for either an extended research visit or a postdoctoral appointment.

## **3.4 Improving learning environment of own PhD program**

### *3.4.1 Were the international activities and the experiences of the participants effective towards a revision of the curriculum or other program features?*

It is too early to assess the effects of the international collaboration on curriculum and other program aspects. However, a few changes that participants attributed to the cooperation have been implemented or are scheduled for the next phase. The UE Berlin program admitted new students to a second program cycle in the spring of 2005. This three-year program integrated several features that were adapted from the UE Seattle program extension and offers now an orientation workshop with training in team-work skills, communication facilitation throughout the program, two dissertation advisors for each student, and a common chapter of the

dissertation. These changes came as a result of workshop discussions between students and faculty and amongst core faculty about how the next cycle could be improved by adopting successful practices from the partner program. The students felt encouraged to participate in these discussions by the example of their Seattle peers and their more active involvement in program planning and improvement. The UE Seattle program is in its renewal process; for the next cycle, faculty plan to expand their structural model by including more hands-on, practitioner-oriented course content and the participation of practitioners in the assessment of research outcomes. Once the joint book of basic texts in urban ecology from both countries is available, more international aspects will be integrated into the curriculum of both programs.

All four programs have to go through renewal processes with their national science foundations. For some of them the international component has proved to be an instrumental element for getting approved and funded in the future. Their intense international activities distinguish these programs from other IGERT or GRAKO programs and give them an edge in the competitive struggle for funding.

### *3.4.2 What impact had international collaboration and travel on student-faculty relations?*

We found that one of the unintended outcomes of the joint workshops was a better relationship between students and faculty in the programs. Several students and faculty described that they learned many surprising facts about their own program, their peer students and faculty while organizing and attending the workshops and traveling as a group to their partner programs. Often they learned a lot about their peers' research; often the interest of the visitors fueled their own curiosity. For most of them this was the first time student and faculty traveled together. This had the effect that student-student, student-faculty and faculty-faculty rapport improved as they spent more time together than ever before. They interacted in a non-university environment and thus got to know each other better. This was especially true for those programs that usually did not engage in frequent informal student-faculty activities. The comparison with the partner program and country sometimes helped to appreciate the own program more, especially those features that distinguished the own program such as team teaching, special equipment, generous financial support, good student-faculty rapport, or great teachers.

## **4. What were the hurdles for successful international cooperation?**

### **4.1 What impact did structural and organizational problems have?**

The timing of group visits during field season created stress and made it difficult for some of the UE students to participate. It is a complicating factor that can not be avoided even with long-term planning. Some field work has to be done on a regular basis or a certain time of the year even during times when both partner programs can meet. Students, with the help with their faculty advisors, sought to minimize the impact of the interruptions by training and employing substitutes to continue field work in their absence. Timing of field work was but one scheduling problem that jeopardized successful collaboration. Students who got institutional funding for three years and were supposed to finish their dissertation research in that period were loath to spend much time on activities that were not directly related to this goal. This was especially true for German students whose financial support after three years was in limbo.

Moreover, they felt pressure from core faculty to finish on time as proof that their model program was living up to expectations of the funding agency.

Only very few students found a perfect match in the partner program with their research projects. Faculty were aware of this limitation but many students were in the beginning disappointed that they would not be able to engage in joint research right away. Urban ecology faculty therefore put emphasis on the networking and scientific culture aspects of the collaboration, while bioinformatics faculty mainly tried to organize high quality scientific workshops to engage their students' interest.

#### **4.2 What role did language barriers play?**

Many of the Americans students and faculty admired other nationals who could converse in English (and other languages). They felt humbled and were in general patient and tried to understand the non-native speakers. As their command of the English language varied widely, this was not always easy. Americans were surprised how many Germans spoke English well and tended to forget that that was not true for all participants in the workshops. Many Germans expected native English speakers to be aware of that situation and to speak slowly and clearly. Germans found it very strenuous to listen to and to converse in English over a long period of time. Some of these problems had been communicated forcefully and repeatedly with this researcher and amongst the German students; however, they had not been addressed in open discussions during meetings, except for one of the preparatory UE Seattle workshops when brought to the students' attention by this researcher.

Germans often felt like second-class participants in English speaking audiences; they were afraid of being misunderstood as not in full command of their topics, because they were not able to express themselves as eloquently as they would in their own native language. That's why German students and faculty who had not been to an English speaking country for an extended period of time were often shy in participating in scholarly discussions and social conversations. They tended to stay in their "comfort zone" by speaking German with Germans, by which in turn their American partners felt excluded. These hurdles became less debilitating over time with more English language practice of the Germans and growing familiarity with foreign accents of the Americans.

Even with a fairly good command of English certain terms lend themselves to wrong use and that lead to miscommunication. (For example, in English "faculty" means the professors, while in German "Fakultät" means the department or college. In U.S. universities, "promotion" refers to movement up the career ladder. In German, "Promotion" is a synonym for the doctoral thesis.) Sometimes such miscommunications made it more difficult on both sides to work together with ease. About half the students and a third of faculty who hailed from the former East Germany had to face a special disadvantage that stemmed from the tradition in the Soviet block countries to learn Russian as the main second language instead of English as in the Western part of Europe. One attempt to overcome language barriers was a well received and attended week-long course in English scientific conversation, presentations, and publishing organized by the UE GRAKO students.

### **4.3 How were participants dealing with national competition and stereotypes?**

During this initial phase of collaboration CIRGE researchers discovered competition over issues such as which program had the better labs or curriculum; who produced better science and scientists; who had better pedagogical practice; and which program's students would get better jobs and recognition. Students may also compete for the same jobs in the future. When they compared their programs, the German students often expressed envy of the rather generous resources of U.S. universities and the perceived advantages this created for their U.S. peers. On another level, faculty are in fact competitors in a global marketplace for ideas, research money, publication space, jobs, and national leadership in science and technology. This competition explained why some seemed to be reluctant to share early research findings or even graduate students, who, after all, might carry a professor's ideas and knowledge with them into the labs of professional rivals. Tensions surrounding competition were sometimes exaggerated in response to international political events. For example, the first phases of IGERT/GRAKO cooperation coincided with events about which the global community was and remains bitterly divided, such as the U.S.-led war in Iraq.

Pre-existing national stereotypes came into play. According to Americans, Germans lacked humor, followed rules without questioning, were not creative or inventive, and complained a lot, but they were well educated and organized. According to Germans, Americans may be dynamic, pragmatic and well prepared, but they were also superficial smooth-talkers, who wanted to buy and control everything but had little culture of their own. Such stereotypes were, if openly recognized at all, attributed to common knowledge and personal experience not to prejudice. Some students and faculty appreciated after their closer contacts with participants from abroad that they had changed their preformed opinions about people from the other country.

## **5. What were successful features of the international collaboration?**

Here we summarize the activities and program features that were considered successful by the participants.

### **5.1 Annual Workshops**

#### *5.1.1. Theme-based workshops*

Annual workshops were the number-one activity that participants deemed successful regarding their own goals. They provided scholarly and social contacts over several days, an intense exchange of research findings, methods and new ideas. The fact that participants met again over a period of time allowed for increasing ease in communication and for networking beyond narrow personal research interests. The theme-based workshop organization provided a forum for presentations in an international setting without the pressures and anonymity of a general international conference. Spending time together, discussing research projects, debating progress and setbacks, expanding ideas helped in building contacts with other scientists who did not necessarily work at the exact same problem as oneself. This genuine interdisciplinary undertaking was enhanced by the presence and participation of other nationals with different educations, different cultural and scientific thinking patterns.

### *5.1.2 Alternating meeting venues*

Students appreciated the changing venue of the meetings as they alternated between the countries. This way they were able to get first-hand knowledge of educational institutions abroad, the situation in which their foreign peers were working and studying, and the societal context of their discipline in a foreign country. They could practice to be hosts as well as guests with the different roles this afforded of them.

### *5.1.3 Small format of meetings*

Students and faculty liked the small format with no parallel sessions that allowed them to participate in the whole range of their programs' research discussions. It also helped students with limited command of the English language to feel less intimidated. The mingling of students and faculty was easier in a smaller group where after a short time people got to know each other and hierarchy became less an issue.

### *5.1.4 Off-site visits*

In those cases where workshops were held off-site (off-campus or other cities), participants appreciated mainly the opportunity for guests and hosts to spend a lot of time together without being interrupted by 'business-as-usual' activities of host faculty and students. The hosts could immerse themselves into the conference topics without major distractions from other parts of their work and life routines. They would participate more extensively in common activities, especially sight-seeing and social events. Faculty, once they had decided to participate, attended sessions more regularly and reported a more concentrated involvement in the networking efforts as well.

## **5.2 Preparation Training**

### *5.2.1 Preparation workshops*

Students reported that introductory workshops helped them to see their travel abroad as an integrated encounter in which they were more open to a multitude of experiences besides the science part of the workshops. They felt less overwhelmed by cultural differences and felt more confident to venture out by themselves. Through the discussions in advance of the trip they acquired some knowledge about the partner country that helped them to understand differences to their own cultural background.

### *5.2.2 Language training*

English training classes could not eliminate the disadvantage Germans with limited fluency felt compared with their more fluent German peers (or the native-English speakers, for that matter); but it helped them to gain more confidence that they would improve their skills with practice. The concentration of the classes on scientific use of English (presenting and publishing) made them beneficial even for those students who had advanced language fluency.

## **5.3 Student-Faculty Travel**

Students and faculty agreed that traveling together was an important factor for improvement of their own program. For many of them it was the first time they spent much time together outside the laboratory or the classroom. They developed a deeper understanding about their peers' work and how the programs' different parts were connected. Students saw their

advisors in different roles and vice versa. More collegial relationships grew during these trips. Even faculty members who had worked together for many years saw their relationships enriched through the travel experience. Meeting on ‘neutral’ territory even allowed program participants to reduce conflicts that had hampered their interactions at home.

#### **5.4 Access to Peers and Faculty**

Networking was one of the main goals for students and faculty. Networking across status groups is essential for progress in science but difficult to initiate beyond a limited research project. Students discussed with students from programs abroad who would be their peers in their future careers. They also got to know faculty from abroad who could be crucial contacts in their job searches and coming research projects. Faculty could screen for talented students or students with special expertise for their research projects. Faculty also forged connections with faculty abroad and planned joint research projects. Access to people was made easy during the meetings.

#### **5.5 Financial Support**

All programs had funds for student and faculty travel and were able to organize joint workshops. Students and core faculty were encouraged to participate in the collaboration activities. Students reported that the financial support was an essential incentive for their participation when they had to consider time-pressure, conflicting field-work schedules and family responsibilities in deciding whether to travel abroad or not.

### **III. EVALUATIVE FRAMEWORK**

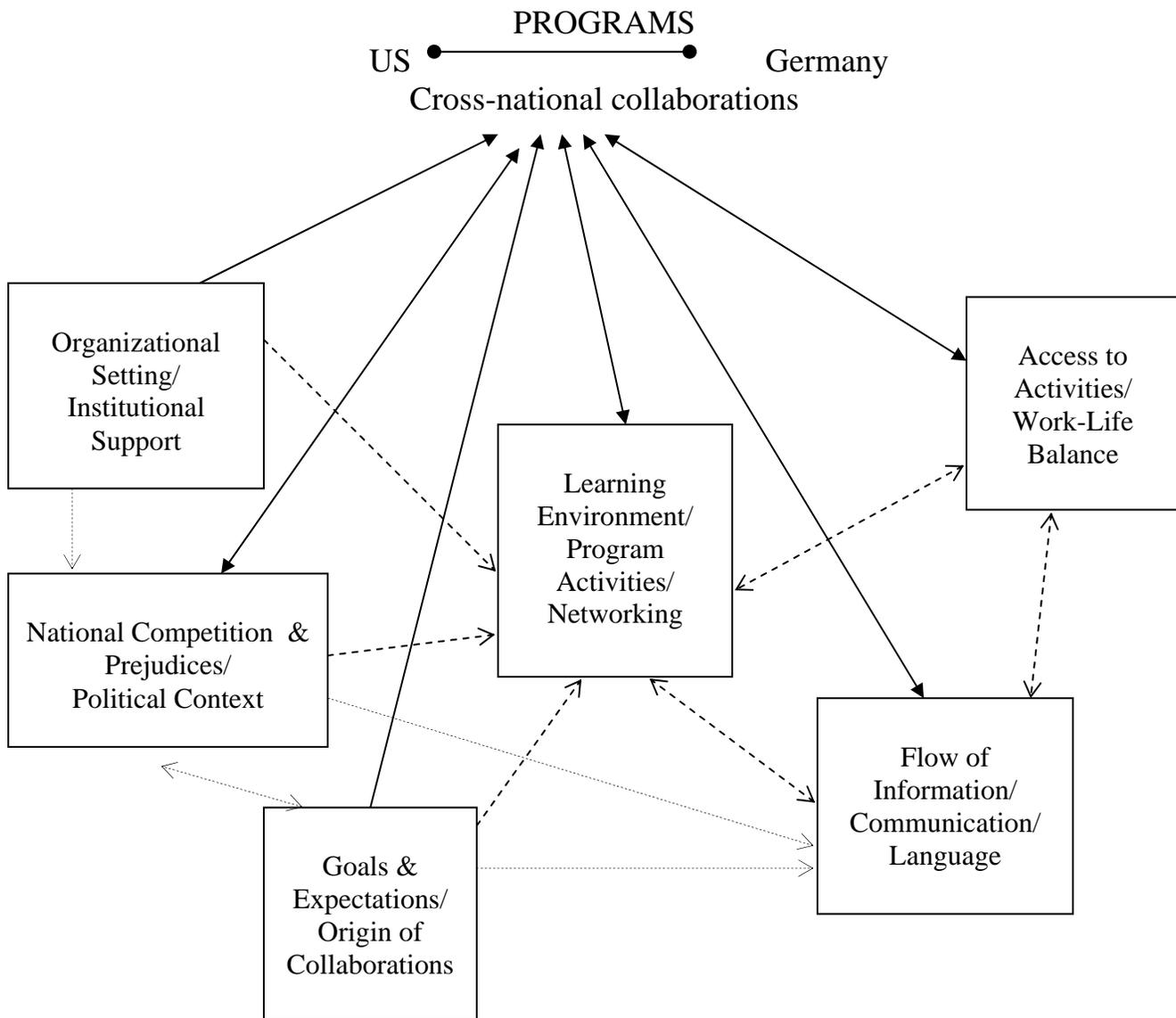
On the basis of the major findings of our evaluation research we designed an Evaluation Framework for the assessment of cross-national collaborations by doctoral programs seeking to add or improve international components. Objectives of the evaluation plan are to determine the effects of exposure to international networking and research at an early stage of doctoral training on the capacity to work across national borders in a globalized science environment. Our following research plan operates on the assumption of the collaboration of a German and a U.S. doctoral program; however, we presume that a similar plan would work for other cross-national collaborations as well. We plan to refine and test the validity of our framework in future research.

#### **1. Dimensions of Program Evaluation**

In a group setting such as doctoral programs the goal of cross-national collaboration would be to integrate doctoral students (and postdoctoral fellows) into an international “community of practice” (Lave and Wenger 1991, Wenger 1998) by training these newcomers to move from the periphery to the center, from apprentice to full member. (In the case of innovative, interdisciplinary programs an international community of practice often doesn’t exist yet and the collaboration activities between the programs create such a community in the first place. If this is the case, faculty members themselves are part of this integration process and insofar subject of the evaluation.) We found several necessary components for the integration process to work to the benefit of the participants (graduate students, postdocs and faculty). The

most important dimension is a learning environment that allows all members to become full participants in the community. Other factors are common goals, expectations and values; a communication and information flow that guarantees equal access for all members; low level of competition or nationalism between programs and members; access of all members to resources regardless of gender, age or status; and reduction of organizational hurdles and restrictions. Figure 1 shows these six dimensions and their interdependencies.

**Figure 1: EDUCATE GLOBALLY ENGAGED SCIENTISTS ABLE TO WORK ACROSS DISCIPLINARY AND NATIONAL BORDERS**



The collaborating programs meet conditions that influence their activities and eventually their success. Some of the conditions exist independently, others can be influenced by the programs.

Arrows indicate influences  
 Double arrows indicate interdependencies  
 Solid lines indicate strong influences or interdependencies  
 Dotted lines indicate weaker influences or interdependencies

Our evaluation framework is organized along these dimensions. We include with each dimension specific evaluation questions and suggestions for success indicators while data collection methods are described separately. Such evaluation questions and success indicators can only be preliminary at this point. They need to be refined during the actual evaluation process according to the specific program goals, activities and settings. Suggestions for interview and focus group protocols are in the appendix.

### **1.1 The Environment for Learning Across National Boundaries**

Successful collaboration requires an educational environment supportive of a learning process that allows newcomers to become members of a community of practice.

*Evaluation questions could be:* How do graduate students, postdocs, and faculty members experience opportunities to learn skills for international collaboration through participation in an international activity? What kind of cross-national networks emerge over time? Do they include graduate students and faculty? What elements of self-identity as scientists are shared by participants? Which elements differentiate the two groups? Do participants define the identity of their program in contrast to or in agreement with the program partners? Is a shared identity that embraces both programs emerging?

Graduate training can be viewed as an apprenticeship: Learning of new skills and knowledge is accomplished by working with successful practitioners and is linked with a changing self-identity. If a new international community of practice is emerging, then we should see participants becoming members of cross-national networks. We should also see students and postdocs developing relationships with faculty members in both partner programs. Concrete measures can be used as indicators of working networks, such as mentorship, exchanges between research labs, relationships with peers and near peers, citations in dissertations and other manuscripts, co-authorship, shared research grants, and composition of dissertation committees. Attention to equity by gender, nationality, and ethnicity in access to such relationships is important.

### **1.2 Goals and Expectations – Origins of Program Collaboration Across National Boundaries**

Successful collaboration requires shared goals and expectations.

*Evaluation questions could be:* How are differences in goals and expectations expressed? Are common goals emerging? What activities advance common goals? How are external interests like funding considerations influencing shape and/or scope of collaboration?

Learning opportunities are most effective when goals and expectations overlap to a large degree. When developing an international collaboration, participants have to find an understanding about goals during the collaborative process. In the beginning individual expectations are quite diverse and not everyone's expectations can be met. Observing the development of shared goals can provide valuable feedback to participants and also serve as an indicator of the success of the collaboration. A question for further research is how the origins of cooperation shape the type of collaboration that develops.

### **1.3 Communication Across Culture, Space, and Time**

Successful collaboration requires fluent communication. There are many barriers to easy communication and information flow in cross-national collaborations.

*Evaluation questions could be:* How are communication barriers manifest and experienced by participants? Are faculty and program administrators aware of such barriers, including language issues? What are programs doing to address barriers? What are programs doing to make sure all participants have access to information? How well is communication being maintained across long distances? Is technology being used as fully as possible?

Distances of time and space, different native languages, different disciplinary cultures, and different academic systems all create barriers to communication and information flow. For example, using English as a common language creates a social hierarchy advantageous to native English speakers. It is a critical component of the evaluation process to monitor the existence of communication barriers and their impacts and to encourage efforts to directly address barriers to information flow through program activities. The ability to address such barriers is also an indicator of program success.

#### **1.4 Nationalism and Competition in International Collaboration**

Successful collaboration requires attention to nationalistic competition and prejudices.

*Evaluation questions could be:* How are competitive issues expressed? Is competition openly acknowledged? If so, when and how and with what consequences? Is it something nobody dares to mention? How are national identities part of social interactions and the emerging self-identities as scientists? How do national stereotypes impact communication and networking?

Nationalistic competition is never far below the surface in international relations. Competition may arise over issues such as which program produces better science and scientists; who has better pedagogical practice; and which program's students get better jobs and recognition. Students may compete for the same jobs. Researchers may be reluctant to share early findings or even graduate students, who, after all, carry a professor's ideas and knowledge with them into the labs of professional rivals. Pre-existing national stereotypes come into play. Indicators for problems regarding national competition would be a reluctance to share information with the partner program or to address tensions that arise from the competition.

#### **1.5 Work-Life Balance in Cross-National Program Collaboration – Equal Access to Activities**

Successful collaboration requires access of all members to all members, information and activities.

*Evaluation questions could be:* How are concerns regarding work-life balance expressed? Does a gender bias exist? Do cultural differences regarding work-family balance and boundaries exist? Do faculty and administrators acknowledge work-family conflicts? What are programs doing to support members' equal participation?

Compared to traditional programs, the international doctoral programs require faculty and graduate students to do more. Participants add international travel, collaboration skill training, foreign language acquisition, and cross-cultural communication to already demanding science studies. Consequently, there is a danger inherent in close international collaborations for students and faculty of making neglect of home and personal life a requirement of successful

participation. Success indicators are the equal participation in international program activities of women and men, parents and non-parents, partnered and single members of all age groups.

## **1.6 Synchronizing Organizational Structures Across National Boundaries**

Successful collaboration requires flexible and effective responses to different educational systems, the rigidity of bureaucratic organizations and time schedules.

*Evaluation questions could be:* How well informed are faculty and administrators about national differences in graduate education? How do they address scheduling problems? Is long-term planning part of the solution? In what way do the institutions and funding organizations support program collaboration?

For example, universities are on different schedules, which leads to problems in the timing of meetings, visits, conferences, and student exchanges. Financial support and funding for international travel of graduate students differs considerably and influences joint activities. Degree requirements and disciplinary curricula and cultures have an impact on research content and methods. Institutional support can also influence the international cooperation. Success indicators are knowledge about the differences in educational systems; attention to logistics and administrative concerns; attempts to long-term planning; and the ability of flexibility and compromise.

## **2. Data Collection and Analysis Methods for Evaluation Processes**

Participant observation, in-depth interviews, focus group discussions, and document analysis are the main methods to be used. (Suggestions for interview and focus group protocols are in the appendix.) Structured interviews that hew fairly tightly to a pre-designed protocol and elicit specific information can support a social network analysis assessing the importance of relationships developed during program collaboration. Techniques for eliciting and analyzing such information have been extensively developed and used by social network researchers (e.g., Dietz 2005; McCallister and Fischer 1983; Moody 2004; Rhoten 2003; Toren 1994). An adaptation of these methods can assess the extent and types of cross-national collaboration of all participants. Structured interviews (complemented by document analysis and web survey) should also be used to gather information on individual-level outcomes of program participation, such as employment status, publications, grants, and awards. Administrative staff should be asked to provide information about the formal and informal relationships through which they get their work done and what additional skills and knowledge the international program collaboration requires. Finally, the capstone of data collection could be a web-enabled survey administered to students and postdocs after they graduate or leave the doctoral program. Graduates and leavers are to be asked to provide information on the outcomes of their participation, their experiences with the program collaboration, as well as opinions on successes and failures of the collaboration. The web survey will allow us to collect systematic responses comparable across individuals and programs.

## **Appendix**

## 1. Interview and Focus Group Protocols

The protocols included here are to support the formative evaluation of international program components outlined in the evaluation framework. Interview/survey questions need to be revised according to specific program features, collaboration progress and emerging evaluation topics. Phase 1 protocols refer to the implementation phase of international collaboration, phase 2 protocols are to be used during the course of the collaboration, and phase 3 protocols are for the outcome phase after students and postdocs have left the program and faculty revised program content and structure.

1. *Interview Protocol – Faculty - Phase 1*
2. *Interview Protocol – Students & Postdocs - Phase 1*
3. *Interview Protocol – Faculty - Phase 2*
4. *Interview Protocol – Students & Postdocs - Phase 2*
5. *Focus Group Protocol – Students – Phase 2*
6. *Interview Protocol – Faculty - Phase 3*
7. *Web-survey Topics – Students – Phase 3*

### ***1. International Cooperation between Interdisciplinary Doctoral Programs*** **Phase 1: Interview Protocol - Faculty**

*The following is the interview protocol for **faculty** participating in the cross-national collaborations between doctoral programs. The **exploratory interviews** are to support formative evaluation of international program components. Interview questions need to be revised according to specific program features. Interviews should be conducted in the language chosen by the interviewee.*

#### **1. Prior Experience**

1. What experience with international cooperation/exchange do you already have? (Study/Field trips, exchange, study abroad, scholarly collaboration, publications, conferences, lectures, etc.)  
*If no previous experience skip to question 10*
2. For how long? How many times? Where?
3. Who initiated the cooperation/exchanges? Who organized it?
4. Who paid for it?
5. What did you benefit from the experience? (Personal, scholarship, professional, career?)
6. Was there anything unpleasant about it?
7. Were your expectations met?
8. Would you do it again? Same country, setting, etc?
9. What would you do differently? Why?
10. Is there any particular reason why you have not previously engaged in international collaboration or exchange?

#### **2. Cooperation with Partner Program**

1. In what way are you participating in the collaboration with the partner program?

*If not collaborating, skip to question 8.*

2. What are your expectations for yourself and for your students?
3. Who is going to benefit from the collaboration?
4. What would be the best possible outcomes you can think of? What is the minimal outcome you would at least hope for yourself, the students, and the program?
5. Do you have any uneasy feelings about this collaboration?
6. Do you think other students/faculty share your view?
7. What would you wish the collaboration looked like at the end of the program?
8. Is there any particular reason why you are not at this time collaborating with the partner program?

### **3. Program**

1. When the opportunity for collaboration arose, what was the most intriguing idea about collaborating?
2. How many resources (money, time, person-power) have you/the program invested so far?
3. How much money does the program has to spare on international cooperation? Where does the money come from? Is it enough? For what would you need more?
4. Are all students/faculty equally interested?
5. What are, in your opinion, the main factors that will make this endeavor a success for yourself, the students, and the program?
6. Can you think of any circumstances that could make it a failure?
7. What role does overall support play for the outcomes (from the university, the administration, other departments, colleagues)?

## ***2. International Cooperation between Interdisciplinary Doctoral Programs*** **Phase 1: Interview Protocol - Students and Postdocs**

*The follow is the interview protocol for **students and postdocs** participating in the cross-national collaboration between doctoral programs. The **exploratory interviews** are to support formative evaluation of international program components. Interview questions need to be revised according to specific program features. Interviews should be conducted in the language chosen by the interviewee.*

### **1. Prior Experience**

1. What experience with international cooperation/exchange do you already have? (Study/Field trips, exchange, study abroad, scholarly collaboration, publications, conferences, lectures, etc.)  
*If no previous experience skip to question 10*
2. For how long? How many times? Where?
3. Who initiated the cooperation/exchanges? Who organized it?
4. Who paid for it?
5. What did you benefit from the experience? (Personal, scholarship, professional, career?)
6. Was there anything unpleasant about it?
7. Were your expectations met?

8. Would you do it again? Same country, setting, etc?
9. What would you do differently? Why?
10. Is there any particular reason why you have not previously engaged in international collaboration or exchange?

## **2. Cooperation with Partner Program**

1. In what way are you participating in the collaboration with colleagues from the partner program?  
*If not collaborating, skip to question 7.*
2. What are your expectations?
3. Who is going to benefit from the collaboration?
4. What would be the best possible outcomes you can think of? What is the minimal outcome you would at least hope for?
5. Do you have any uneasy feelings about this collaboration?
6. Do you think other students/faculty share your view?
7. Is there any particular reason why you are not at this time participating in the collaborative activities?

## ***3. International Cooperation between Interdisciplinary Doctoral Programs*** **Phase 2: Interview Protocol – Faculty**

*The following is the interview protocol for **faculty** participating in the cross-national collaborations between doctoral programs. The **exploratory interviews** are to support formative evaluation of international program components. Interview questions need to be revised according to specific program features. Interviews should be conducted in the language chosen by the interviewee.*

### **Personal Experience**

1. How did the cooperation with the partner program develop since the first joint activities?
2. Are you personally involved in a close collaboration with a doctoral student, a postdoc, or faculty abroad?  
*If yes (list for each person):*  
Who initiated the collaboration?  
How do you communicate? How often?  
Can you describe any tangible outcomes yet? (your research, publications, students' productivity)  
How much of your time do you devote to that collaboration?
3. Are any (further) trips abroad planned?  
*If yes:* Will you participate?  
*If no:* Why not?
4. What are your future plans in terms of international collaboration?
5. What would have helped to foster more intense international collaboration in your case? (learning environment; communication/language; organizational settings; life/work balance)

6. Is there anything that made the international cooperation difficult? (learning environment; communication/language; organizational settings; life/work balance)

### **Mentoring Students**

1. Do your doctoral students or postdocs participate in any collaboration with the partner program?  
*If yes* (list for each person): How are you involved in the process?
2. Do you see any tangible results from their cooperation?
3. Do you mentor any of the visiting doctoral students from abroad?  
*If yes*: What do you think the visits meant for the students from abroad and for the students in your own program?
4. Does the collaboration have an effect on the student's dissertations?
5. How do you expect the international collaboration will affect students' chances on the job market?
6. Do you have any advice for doctoral students at home and abroad how to go about international collaboration in the future?

### **General**

1. So far, were your expectations met, not met, more than met?
2. Up to now, who benefited the most from the international collaboration? (faculty, students; your program, the partner program; short term and long term)

## ***4. International Cooperation between Interdisciplinary Doctoral Programs*** **Phase 2: Interview Protocol - Students and Postdocs**

*The following is the interview protocol for **students and postdocs** participating in the cross-national collaborations between doctoral programs. The **exploratory interviews** are to support formative evaluation of international program components. Interview questions need to be revised according to specific program features. Interviews should be conducted in the language chosen by the interviewee.*

1. How did the cooperation with the partner program develop since the first joint activity of the programs?
2. Are you personally involved in a close collaboration with a doctoral student, a postdoc, or faculty abroad?  
*If yes* (list for each contacted person):
  - Who initiated the collaboration?
  - How do you communicate? How often?
  - How often have you met? Where?
  - Can you describe any tangible outcomes yet? (dissertation research; literature used in dissertation; publications; job search, networking)
  - How much of your time do you devote to that collaboration?
  - Do you need/get any support from faculty or the administration of your program?
  - Are any further trips abroad planned?

*If yes:* Do you anticipate any financial aid? How much will it cost? Who comes up with the balance?

*If no:* Why not?

3. What are your future plans in terms of international collaboration?
4. In your case, what would have helped to foster more intense international collaboration? (learning environment; communication/language; organizational settings; life/work balance)
5. Is there anything that made the international cooperation difficult? (learning environment; communication/language; organizational settings; life/work balance)
6. Do you expect the international experience to have any influence on your job search?
7. Do you have any advice for other doctoral students in your field how to go about international collaboration?
8. Do you have any advice for your doctoral program how to go about international collaboration?
9. So far, were your expectations met, not met, more than met?
10. Who benefited the most from the international program ? (faculty, students; your program, the partner program; short term and long term)

## ***5. International Cooperation between Interdisciplinary Doctoral Programs*** **Phase 2: Focus Group Discussion - Students**

*The following is the focus group protocol for **students** participating in the cross national collaborations between doctoral programs. The **focus group discussions** are to support formative evaluation of international program components. Focus group questions need to be revised according to specific program features. Initial questions can be followed by “probes” in case silence greets the first formulation.*

As you know we are convening this group discussion because we would like to know more about the pros and cons of international collaboration at this stage of your doctoral studies.

The following questions are intended to help us to understand the range of views on that issue.

1. Is international cooperation an integral part of your doctoral studies?  
(Probes: participation in activities; contacts with students, postdocs, faculty; presentations)
2. What kinds of gains from the international collaboration do you expect?  
(Probes: dissertation, literature, personal growth, post-doc, work abroad, networking, joint research, publications)
3. Do you expect to add important information to your doctoral research?  
(Probes: data, literature, ideas)

4. For some people international exchange and field trips to another country are/were a distraction from their dissertation research? Do you feel the same way?
5. Please summarize your personal feelings – pro and con – regarding program level international collaboration in general and the experience with this collaboration partner in particular.

## **6. International Cooperation between Interdisciplinary Doctoral Programs**

### **Phase 3: Interview Protocol – Faculty**

*The following is a preliminary interview protocol for **faculty** participating in the cross- national collaborations between doctoral programs. The final interview protocol can only be designed at the beginning of phase 3 after additional topics and questions emerged during phase 2. The **exploratory interviews** are to support formative evaluation of international program components. Interview questions need to be revised according to specific program features. Interviews should be conducted in the language chosen by the interviewee.*

#### **Learning Environment**

1. Number of persons from partner program you had personal contact with during the collaboration (students, faculty, postdocs)
2. Quality/content of contact
3. Number of events you participated in
4. Adequate information about goals, content, schedules, and activities?
5. Adequate access to all resources? (students, other faculty, money, time)
6. Preparation of international activities
7. Number of mentored students/postdocs from abroad
8. Quality of mentoring

#### **Work/Life Balance**

1. Events missed – for what reasons
2. Responsibilities/interests outside doctoral program
3. Balance between work and life
4. Trade-offs
5. Unexpected influences on work or life?

#### **Communication/Language**

1. Rating of own language skills (how many languages, fluency, learned when)
2. Adequate language skills?
3. Language barriers in which context
4. Program remedies
5. Personal remedies
6. Influence of language issue on collaboration (self, students, faculty; own and partner program)
7. Use and influence of communication technology

### **National Competition/Political Context**

1. Change in outlook/perception of partner country?
2. Surprising encounters
3. Ranking of programs with regard to scholarship; quality of students, faculty, postdocs; administrative support; financial support; program structure; curriculum; rapport between students and faculty; cohesion between faculty; university system
4. Influence of political events on collaboration
5. Wish/ability to work in partner country?

### **Organizational Setting**

1. Time spent
2. Time restraints
3. Money spent; available and used financial support
4. Available and used administrative support
5. Scheduling conflicts (travel, research, study, family)
6. Organizational compromises

### **Productivity / Outcomes**

1. Number of presentations at international workshops/conferences
2. Number of articles in international journals
3. Number of joint articles in (international) journals
4. Number of books/ book chapters with international collaboration
5. Influence of international collaboration on own research?
6. Tangible results for students from the collaboration (joint publications, publications abroad, citations, visits abroad, networking, changed focus in research topics or methods, etc.)
7. Effect on the students' job search and/or further research?

### **Satisfaction**

1. New contacts
2. Most important activities/contacts in the past
3. Satisfaction with past development of contacts
4. Missed opportunities
5. Expectations met, not met, more than met?
6. Who benefited the most from the international program ? (faculty, students; your program, the partner program; short term and long term)

### **Full Participation in the Community of International Scholars?**

1. Member of international professional organizations/networks?
2. Prospect of contacts in the future
3. Joint research projects in the future
4. Plans for work abroad

### **General**

1. What are the future plans of your program in terms of international collaboration?

2. What changes, if any, in your program regarding international collaboration and otherwise, are resulting from the cooperation? (Curriculum, teaching, core literature, activities; short-term, long-term)
3. What would have helped to foster a more intense international collaboration?
4. Advice for doctoral students in your field how to collaborate internationally
5. Advice for other doctoral programs how to collaborate internationally
6. Advice for your institution how to support international collaboration
7. Advice for funding organizations how to support international collaboration

### **Demographic Information**

Gender, age, nationality/citizenship, family status/partner data, children, dependents, mobility, current position, commute.

## ***7. International Cooperation between Interdisciplinary Doctoral Programs*** **Phase 3: Web Survey - Students & Postdocs**

*The following is the preliminary Web survey content for **students and postdocs** participating in the cross-national collaborations between doctoral programs. The final survey can only be designed at the beginning of phase 3 after additional topics and questions emerged during phase 2. The Web survey is to support formative evaluation of international program components. It should be conducted 1-2 years after students and postdocs have left the program.*

### **Learning Environment**

1. Number of persons from partner program you had personal contact with during the collaboration (students, faculty, postdocs)
2. Quality of contact
3. Number of events you participated in
4. Adequate information about goals, content, schedules, and activities?
5. Adequate access to all resources? (faculty, peers, money, time)
6. Integration of previous experience abroad in curriculum
7. Preparation of international activities
8. Quality of mentoring

### **Work/Family Balance**

1. Events missed – for what reasons
2. Responsibilities/interests outside doctoral program
3. Balance between work/studies and life
4. Trade-offs

### **Communication/Language**

1. Rating of own language skills (how many languages, fluency, learned when)
2. Adequate language skills?
3. Language barriers in which context
4. Program remedies
5. Personal remedies

6. Influence of language issue on collaboration (self, peers, faculty; own and partner program)
7. Use and influence of communication technology

### **National Competition/Political Context**

1. Change in outlook/perception of partner country
2. Surprising encounters
3. Ranking of programs with regard to scholarship; quality of students, faculty, postdocs; administrative support; financial support; program structure; curriculum; rapport between students and faculty; cohesion between faculty; university system
4. Influence of political events on collaboration
5. Wish/ability to work in partner country?

### **Organizational Setting**

7. Time spent
8. Time restraints
9. Money spent; available and used financial support
10. Available and used administrative support
11. Scheduling conflicts (travel, research, study, family)

### **Productivity / Outcomes**

8. Number of presentations/posters at international workshops/conferences
9. Number of articles in international journals
10. Number of joint articles in (international) journals
11. Number of book chapters with international collaboration
12. Studies and dissertation research
  - Influence of international collaboration on dissertation research?
  - Benefit other than on dissertation research?
  - Unexpected influences on studies or life?
13. Influence on job search?

### **Satisfaction**

1. Most important activities/contacts in the past
2. Satisfaction with past development of contacts
3. Missed opportunities
4. So far, were your expectations met, not met, more than met?
5. Who benefited the most from the international program ? (faculty, students; your program, the partner program; short term and long term)

### **Full Participation in the Community of International Scholars?**

1. Member of international professional organizations/networks?
2. Prospect of contacts in the future
3. Joint research projects in the future
4. Plans for work abroad
5. Advice for other doctoral students in your field how to collaborate internationally
6. Advice for your doctoral program how to collaborate internationally

## **Demographic Information**

Gender, age, nationality/citizenship, family status/partner data, children, dependents, mobility, income, current position, commute.

Career goal; career goal changed since begin of graduate studies?

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