Provost's Globalization Task Force Report

Worcester Polytechnic Institute
Report of the Provost’s Task Force on the Globalization of WPI

May 2012
Executive Summary

WPI was founded in 1865 to create and convey the latest science and engineering knowledge in ways that are most beneficial to society. The founders of the institution believed in creating a new style of university that would provide the scientists, engineers and entrepreneurs needed for an era of industrial growth and technological innovation. Since that time, WPI has continued to be a place where cutting edge science and technology meet real world challenges. To continue at the forefront and prepare technical humanist for the challenges of the future, the Global Task Force encourages WPI to chart a bold course.

The Provost’s Task Force on the Globalization of WPI recommends these three broad areas for exploration with details to follow in the report:

- Incorporation of international education and cultural awareness into the heart of the WPI curriculum through expansion of the Great Problems Seminar, increased visibility around the Project Centers, development of more globally focused courses, engagement of international faculty through an International Scholars in Residence program and enhanced programming highlighting international work of faculty and students.

- Increasing WPI’s global footprint through meaningful and strategic relationships with a small number of targeted international sites that provide research and recruitment opportunities for our students and faculty including new funding avenues.

- Improving vital infrastructure, such as housing and telecommunication facilities, to support new initiatives.

We believe the initiatives described in this report, phased in appropriately, will position the institution, our faculty and our students for serving, succeeding and leading in today’s global environment.
I. Background

Rationale for our work

WPI’s educational mission is to discover, to create and to convey knowledge at the frontiers of academic inquiry for the betterment of society. Fulfilling this mission requires connections to the broader global community. A community in which recent technological advances have resulted in easier technology transfer and collaborations, cheaper travel, instant global communications and increasing labor migrations. If we are to prepare our students to bring knowledge to bear on the world’s greatest challenges and to become the leaders in solving the problems of tomorrow, we must educate toward an understanding of the global nature of today’s world. To better understand this nature and to identify the best opportunities for WPI in this rapidly changing global environment, the Provost formed a Task Force on the Globalization of WPI. The Task Force was charged to assess the current standing of WPI and to make recommendations for expanding WPI’s global footprint. Through the strategic and meaningful global engagements described in this report, WPI will be stronger - a more competent and competitive institution better able to respond to the educational, technical and cultural needs of our community of faculty, students and staff.

A review of WPI’s Current Global Standing and Engagements

WPI has a long history of providing student with a global context for their studies. Through its Global Perspective Program (GPP), WPI sends nearly half of all students overseas and has operated the program for nearly three decades. According to the text *Shaping our World: Engineering Education for the 21st Century* edited by Gretar Tryggvason and Diran Apelian, WPI has sent more engineering students abroad than any college or university in the country, regardless of size. Nevertheless, the GPP’s primary distinction is not in its scale, but in its educational focus and scope. Traditionally university students engage in study abroad by attending courses at host universities; however, WPI students travel around the globe to solve problems for local agencies and organizations under faculty guidance. Combining project-based experiential learning, service learning, undergraduate research, and study abroad, the program is a model of how universities can place high-engagement experiences at the center of the curriculum rather than at its periphery. While enhancing global learning, the program also promotes significant achievement in interdisciplinary problem solving, critical thinking, communication, and teamwork – essential skills for 21st century global professionals.

Another vital component to WPI’s current global engagements is the research and collaborations of individual faculty with their international colleagues. An internal survey of faculty was performed to determine the number and type of current one-on-one international
collaborations. 43 faculty members responded to this survey indicating international collaborations in 45 countries. 38% of these collaborations were externally funded with 90% involving faculty at other institutes of higher education (for an idea of the global distribution of these interactions see the map in Appendix VII).

Despite these current global activities, WPI does not make the list of the top 500 international institutions of higher education (determined by either Quacquarelli Symonds Top Universities, with ranking criteria based 40% on academic reputation in a global survey, 10% on employer reputation from a global survey, 20% on citation from sciverse scopus, 20% on faculty student ratio, 5% on proportion of international faculty and 5% on international student population or the Time Higher Education Survey with ranking determined by 30% citations and research, 30% teaching, 30% research volume and income, 7.5 % international mix of students and faculty, 2.5% industry and innovation income).  While there may be great debate on whether rankings truly reflect the quality of an education, it is a factor that must be considered because rankings often play into the decision of students and faculty when choosing between WPI and competitor schools. With the populations of students completing higher education degrees outside of their home countries expected to triple in the next three years, WPI has an opportunity to position itself to attract and support this evolving student population. Recruiting the best students and improving WPI’s national standing will also help in competition for the best and brightest faculty. All institutions are seeing increased competition for the best scholars and in order to stay at the forefront WPI must recruit the best and brightest from around the world.

**General Observations**

After examining WPI’s current global engagements and the needs of our faculty, our students, and their employers, the following general observations have emerged and will be key to the continued health of the institution:

- Preparing our students to be the successful leaders of tomorrow requires that they have a global perspective. Facing the challenges of the future will require comfort working with interdisciplinary teams to solve complex problems and the ability to effectively communicate across both disciplinary and cultural borders. WPI has a very successful projects based curriculum that provides global opportunities and experiences for our students. Building upon these programs, WPI is poised to increased global engagements, both at home and abroad, preparing our students for their future careers.

- Partnering with research collaborators around the globe allows us to understand the ever-changing challenges facing nations and, through combined, integrated research efforts,
lead the way to new solutions. Collaborations around the world also allow for access to additional resources including students, technologies and funding sources. Supporting and expanding the current individual collaborations of our faculty will be critical to sustained, meaningful relationships established with institutions and corporations around the globe.

- Solving these complex global problems requires talented students and faculty. If we want to continue to attract the most talented students and faculty, we must position ourselves so that they are aware of all the benefits of a WPI education.

- Without a strategic plan for global engagement in place, most interactions have been reactive instead of proactive with engagements neither initiated nor coordinated with central university aspirations. To make the most of resources, WPI must set priorities based on a defined set of institutional goals for targeted global engagement. All university faculty should be free to pursue engagements – as long as these are consistent with the policies of WPI and expectations for faculty productivity. Therefore, we need a coherent, clearly defined global strategy for international engagement that is consistent with our entrepreneurial nature.

Overview of Globalization Goals in Alignment with WPI’s mission

The expansion of WPI’s global footprint must be done thoughtfully and in alignment with the mission and goals of the institution as stated below.

WPI’s Mission

“WPI educates talented men and women in engineering, science, management, and humanities in preparation for careers of professional practice, civic contribution, and leadership, facilitated by active lifelong learning. This educational process is true to the founders’ directive to create, to discover, and to convey knowledge at the frontiers of academic inquiry for the betterment of society. Knowledge is created and discovered in the scholarly activities of faculty and students ranging across educational methodology, professional practice, and basic research. Knowledge is conveyed through scholarly publication and instruction.”

WPI’s Goals

The goals of the undergraduate program are to lead students to develop an excellent grasp of fundamental concepts in their principal areas of study; to lay a foundation for life-long renewal of knowledge; to gain a mature understanding of themselves; and, most importantly, to form a
deep appreciation of the interrelationships among basic knowledge, technological advance, and human need. These principles are today manifest in the *WPI Plan*, a unique, project-oriented program that emphasizes intensive learning experiences and direct application of knowledge. WPI remains committed to continued educational improvement and innovation.

The goals of WPI's programs of graduate instruction and research are to create and convey knowledge at the frontiers of academic inquiry. These endeavors are founded on the principle that vigorously pursued and rigorously assessed scholarship is the lifeblood of the institution. High quality graduate instruction conveys the arts of scholarship to new generations, and it assists working professionals in maintaining currency in a world where knowledge becomes obsolete with ever-increasing rapidity.

**Global Task Force Unifying Principles**

In order to fulfill the mission and goals of WPI, opportunities must be provided for students and faculty to engage with the world. These engagements need to be strategic high value opportunities that further the educational, research, corporate and community involvement initiatives of WPI.

The Global Task Force (GTF) broadly suggests that our institutional engagements:

- Integrate programs and curricula that highlight global issues.
- Cultivate relationships with institutions, corporations and governments that enhance WPI’s global presence and leadership.
- Create an environment that encourages faculty relationships with colleagues abroad.
II. Opportunities for Globalization of WPI

Members of the GTF believe that successful expansion of WPI’s global efforts should not be a “top down” strategy driven by the administration nor “bottom up” strategy driven by faculty and students but must involve coordination and mutual support from all parties. Faculty should be free to pursue individual relationships with domestic and international collaborators that provide the most promise for intellectual advancement. However it must be recognized that the administration is in a position to see the broader picture of WPI’s global engagements. The administration can observe clusters of interests in particular locations around the world or around particular ideas/research areas and based on these observations develop strategies that coordinate and align efforts of individual faculty members with the institutional mission. To achieve a “culture” of global engagement, we recognize that resources will be needed or redistributed.

Additionally, WPI has the opportunity to engage alumni in every phase of the global strategy. Our alumni work and have contacts all over the world. The institution should analyze and take advantage of these relationships as we think about and begin to establish our global strategy. In addition to help in building relationships with international corporations and foreign governments, engaging our alumni increases opportunities for students on campus through alumni lecture series focused on international work experiences. Engaged alumni might also provide internship opportunities either domestically or abroad for students. Finally establishing and maintaining significant and meaningful connections with alumni could enhance the cultivation of giving relationships.

As a result of the work of the GTF, the following five opportunities for the global engagement of WPI have been identified and are summarized here.

1. Improve support of individual collaborations between WPI faculty and their international colleagues
2. Integration of “global” into the curriculum
3. Development of relationship hubs at strategic sites around the world
4. Establish an International Scholar in Residence program
5. Provide scholarship to outstanding international students

We also propose to link all activities and disseminate information about WPI’s global engagements using public social networks and multimedia channels such as Facebook, YouTube and possibly through the development of a new specifically designed virtual WPI community.
1. **Improve support of individual collaborations between WPI faculty and their international colleagues**

At the heart of the WPI plan is the passion of the individual faculty for their research and their desire to share in this work with students. Developing strategies that support the work of individual faculty with colleagues who share their passion without the limits of geography has many benefits for the faculty, students and institution. It builds knowledge, provides access to new techniques and equipment and improves WPI’s international reputation. In addition, research with colleagues in other countries opens new avenues of funding. Collectively, these activities increase faculty engagement and satisfaction while contributing to recruitment and retention of new faculty.

**Short Term Recommendations –**

The Global Task Force recommends near term (year 1) action to improve infrastructure in support of current faculty collaborations. Two areas of immediate need are housing and communications.

- Establish an International Guest House, housing specifically designated for visiting scholars. The International Guest House should be dedicated for short or long term use of paying international scholars or guests. Alternatively, a revenue generating bed and breakfast within walking distance for guests could be established.

- Establish a residence for visiting international students.

- Designate a contact person or cultural center to support visiting scholars and to ease the transition for faculty. The responsibilities of the position include:
  - Solving problems around transportation, visas, communication, resources and cultural differences.
  - Developing guides for faculty describing the necessary steps for hosting a visiting scholar.
  - Serving as a resource for all information around visiting scholars such as the number and countries of scholars on campus at any given time, housing availability, funding sources and opportunities, and activities of scholars on campus.
• Create two state-of-the art telecommunication facilities – one on the main campus and one at Gateway Park. These facilities should:
  o Provide high quality multiparty video teleconferencing.
  o Accommodate both one-on-one interactions as well as small groups.

**Long Term Recommendations –**

• Establish a cyber-enabled teaching facility to link faculty and coursework to a global market.

• Sponsor symposia that bring in international experts to establish WPI as a thought leader in strategic areas.

**Funding Needs**

To implement the above recommendations for improving the support of individual collaborations between WPI faculty and their international colleagues, funds are needed for:

• Two state-of-the-art video conferencing facilities.
• Investments in housing.
• Supporting 1-2 International Scholars in Residence.
• A high level position such as Vice President of Global Engagements (or similar title).

2. **Integration of “global” into the curriculum**

The Global Task Force recognizes that if globalization of WPI is to be meaningful to our students, its initiatives must be grounded in curriculum. Without thoughtful incorporation of global issues and perspectives throughout the curriculum, students will not be able to see the connections between their major fields of study and a few “global” courses they might be required to take and an opportunity for developing engaged global citizens will be lost.

Students’ interest and experiences with global issues varies greatly on the WPI campus - some have significant international experience, others have never been outside of the state, some may want to take a few courses with a global focus on campus while others will study abroad and a small group may want to make global studies the centerpiece of their education. Equally important are the international students that come from abroad to study here at WPI. The GTF considered all students in our plans for expanding global educational opportunities on campus and around the world.
Short Term Recommendations -

- Expand the global content in courses by:
  - Developing faculty incentives for incorporating global issues into their courses including:
    - Creation of professional development programs that aide faculty in redesigning courses with a more global focus, particularly in engineering and science where linkages are less often found.
    - Providing faculty time to develop programming to support global initiatives.
    - Demonstrating appreciation of transforming courses during review processes.
  - Bringing individuals who can address global issues into courses to share their perspectives.

- Build on WPI’s successful project based curriculum through programs that:
  - Make the work done at WPI’s Project Centers more visible and accessible. This might include the activities such as:
    - Creating a web platform and template to support websites to serve as permanent records of each project.
    - Creating a dynamic web presence for each Project Center to promote the body of work done at the center and maintain connections with center alumni.
    - Facilitating creation of video content by providing project students with video equipment and guidelines, and highlight project student video content on the WPI webpages.
    - Connecting classrooms here and abroad through a shared project.
  - Highlight Project Centers with a Day of Celebration on campus.
  - Celebrate Project Center milestones both on site and on campus. As an example, 2012 is the 10th Anniversary of the Hong Kong Project Center. A small celebration was planned on site in Hong Kong but there was no reciprocal celebration on campus. Students, faculty and alumni might not be able to travel to China but might celebrate this event on campus.

- Encourage and support the student programming committee to include more global and cultural programs including:
  - Inclusion of more significant programming during International Week.
  - Establishing an International Film Festival.
Increasing support to International Student Council and the Office of International Students and Scholars to encourage more outreach and engagement across campus.

**Long Term Recommendations –**

- Expand the Great Problems Seminars by:
  - Increasing the number of times the courses are offered and/or expand the number of topics so that all interested students may participate.
  - Developing a dynamic and engaging web-based platform to share the Great Problems Seminars with the world.
  - Changing the title from Great Problems Seminars to Global Problems Seminars.

- Make global awareness and engagement an explicit theme of New Student Orientation.

- Create a global studies major/minor or certificate program that includes study abroad, substantial course work in global issues and significant language study.

- Build on relationships with foreign universities and individual faculty to offer additional educational experiences for students including:
  - Development of IQPs and MQPs that include mixed host-WPI teams supervised by faculty at the partnering institution.
  - Utilization of the improved telecommunication infrastructure. Activities might include:
    - Supporting work of virtual teams between WPI students on campus and students from partnering institutions abroad.
    - Maintaining relationships built during project work.
  - Creation of dual degree programs with selected institutions.

- Fund additional scholarships for Global Perspective Program participation to make off-campus project experiences possible for all qualified WPI students.

**Funding Needs**

To begin the curricular initiatives described above, the GTF recommends funds for:

- Summer faculty development for global course module development.
- Inviting guest speakers into courses.

In addition, faculty leadership will be needed to develop sustainable dual degrees.
3. Development of relationship hubs at strategic locations around the world

To position WPI as a global leader in education, research and corporate engagement the development of strategic relationships with institutions of higher education, research centers and corporations around the world are key. The GTF envisions the WPI campus as the center of a number of relationship hubs. These hubs would be chosen strategically based on the opportunities they provide the institution. At each hub site multiple relationships must be established allowing for deep and sustainable engagement in the area. These relationships might include multiple institutions of higher learning, a wide range of industrial partners as well as the local government. Each hub site will have a different set of relationships depending on the strengths of the area and the needs of WPI but what all sites should have in common are meaningful, sustainable, layered relationships with the institution.

Successful establishment of hub sites across the world have many potential benefits for WPI. Building new, significant relationships will grow international awareness of WPI. If done well, this should improve WPI’s international standing as a leader in innovative technological education. Just like the individual relationships discussed earlier, relationships with other governments, corporations and educational institutions will increase both funding and research opportunities for our faculty. In addition, WPI has alumni working all over the world. The institution has the opportunity to connect or reconnect with alumni and use their connections and expertise to improve WPI’s global brand and to make new corporate engagements. The suggested hubs were chosen by consensus of the external committee with concurrence by the internal committee. The current list of hub areas includes Brazil, China, Russia, Singapore and Switzerland. We appreciate that specific differences exist and that opportunities as they present themselves should be undertaken. It is important to note that the 5 hub areas listed represent current strategic markets, yet other areas, due to significant relationships or areas of expertise, may become more important. However once commitment to a hub area is decided, WPI should begin to build deep roots.

Short Term Recommendations –

- Form a committee charged with expanding the idea of the relationship hubs with the WPI campus at the nexus. Responsibilities of this committee include:
  - Establishing a clear set of goals and outcomes for hub activities.
  - Cultivating the current budding relationship with the country of China and within Europe through a center in Switzerland.
  - Focusing on strategies for building relationships with the other identified hub sites such as Singapore, Russia and Brazil.
1. Creating Project Sites in hub areas.
2. Inviting Scholars from the hub regions to campus as part of the International Scholars in Residence Program.

**Long Term Recommendations** –

- Expand hub relationships to include dual degree programs.
- Link relationships between academic and corporate partners at the consortium level to coordinate efforts and insure deep, meaningful and continuing relationships.
- Recruit students to our undergraduate and graduate programs from the best schools and institutions in the Hub area.

**Funding Needs**

Travel funds will be needed to establish relationships in which other GTF elements such as International Scholar in Residence and curriculum can be deployed.

**4. International Scholar in Residence Program**

The GTF was surprised to learn that over forty international scholars in the form of postdoctoral fellows, graduate students and research faculty will visit the WPI campus this year. Most, if not all, are not visible outside the department or lab they are visiting and are not viewed as being here for our students and community or as an international scholar. WPI has the opportunity to either increase the visibility of a small subset of these scholars or to develop a new competitive program that would bring in high profile international scholars to campus. The GTF recommends the latter as a first step. In either case, the visitors would be expected to participate in the life of the institution. The benefits of the program are encouraging faculty collaborations with scientists, engineers and humanists from abroad that might lead to new avenues of research and funding. In addition, our students are exposed to researchers from around the world who can contribute to not only the students’ academic development but also to their appreciation of different cultures. Finally, visiting scholars could be “trained” in our IQP and MQP requirements so that they might lead our student projects in their home country.
Short Term Recommendations –

- Develop International Scholar in Residence program. Key elements of this program will include:
  - Required contribution to the life of campus through guest lectures, seminars and other types of programming.
  - Creation of an International Guest House to support the housing needs of visiting scholars. As described in the support of faculty collaboration, the GTF strongly recommends dedicated housing for visiting international faculty.
  - Designation of a contact person or cultural center to support visiting scholars and ease the process for faculty. See page 7 for details.
  - Improving telecommunication facilities to allow for continued engagement between institution and scholar.
  - Coordination of the International Scholar in Residence program to complement hub sites.
  - Providing instruction on mentoring and assessing IQP and MQP programs.

Long Term Recommendations –

- Utilize the hubs and International Scholar in Residence to facilitate contacts and enhance multiple faculty exchanges.

- Develop an Alumni Host program. Alumni Hosts would assist the International Scholars in Residence’s transition to the Worcester area by making contact prior to travel and continuing as a resource for suggestions of local attractions and activities, helping with languages and serving as an additional contact for those new to the area.

- Establish recruitment protocols and training for the International Scholar so that they can help recruit students to WPI and supervise projects once they return to their home campus.

Funding Needs

In order to establish an International Scholar in Residence Program, the GTF recommends funds for:

- Recruitment of International Scholars in Residence to WPI.

- Scholars to initiate recruitment activities of students from their home institutions to WPI.
5. Scholarship for outstanding international scholars

The opportunity to create a full scholarship including room and board for the best and brightest student(s) from specific regions or high schools around the world is believed to be a fast start to increasing our profile at high demand high schools and universities for both undergraduate and graduate students. The rationale is that this scholarship would bring talented individuals to WPI for their education. These talented individuals would contribute to the institution in multiple ways including their academic skills and diversity of experiences. In addition, these students would serve as ambassadors for a WPI education when they return to their home country. This would increase WPI’s international brand and could lead to attendance of other talented students from those same areas – this time without such robust support.

Short Term Recommendations –

- Offer one or two full scholarships in the near future for outstanding international students from strategic locations.
- Define goals of the international scholarships with the hub goals in mind.
- Utilize our international alumni during the scholarship recruitment process.

Long Term Recommendations –

- Target five to six sites where the influence of one student captures two to three other students establishing a critical mass each year attending WPI.
- Establish an assessment protocol for the long term tracking of scholarship recipients examining any effects of the scholarships and recruiting on rankings and other metrics of international standing.

Funding Needs

This initiative will require the provision of free tuition scholarships.
APPENDICES

for the Final Report of the

Provost’s Task Force

on the Globalization of WPI
Appendix I. Formation of the Global Task Force (GTF)

In the spring of 2011 Provost Eric Overström appointed a Global Task Force to identify opportunities for establishing high-value programs that engage WPI with the world and differentiate it from its peers in academia. The GTF includes members of the Board of Trustees, deans and administrators, faculty members, students, and representatives from WPI’s industry and corporate partners and collaborators. A full list of members can be in Appendix III.

The committee was specifically charged to:

1. Assess the current international relationships and standing of WPI.

2. Develop strategies for building international collaborations with global institutions and industries that will provide opportunities to engage WPI’s faculty, students, and academic community.

3. Advise senior administrators on approaches to position the university as a rising and distinctive player in global higher education, while also helping to expand the diversity of the study body and the pool of potential donors to WPI.

4. Report regularly to the President, Provost and WPI community on the progress of the design for a globalization strategy for WPI with final recommendations to the senior administration in April of 2012.

The GTF solicited feedback through email or personal one on one meeting with a number of faculty who described their current international engagements. The results of these communications can be found in Appendix IV.

In order to obtain the students’ perspective, a GTF subcommittee met with a group of student leaders. A summary of this meeting can be found in Appendix V.

A timeline of Global Task Force activities can be found in Appendix II.
# Appendix II. Activities of the Global Task Force (GTF)

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<thead>
<tr>
<th>Date</th>
<th>Events</th>
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<tbody>
<tr>
<td>Spring 2011</td>
<td>Announcement of the creation of a Global Task Force (GTF)</td>
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<tr>
<td>July - September</td>
<td>Elicit members for the Internal Advisory Committee (IAC)</td>
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<td>September 27th</td>
<td>Initial Meeting of the IAC including charge from the Provost</td>
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<td>October 24th</td>
<td>IAC performs a SWOT Analysis facilitated by external evaluator</td>
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<td>October</td>
<td>Elicit members for the External Advisory Committee (EAC)</td>
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<td>November 17th</td>
<td>IAC discusses SWOT analysis and an internal survey of international collaborations, internal website is presented</td>
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<td>December 9th</td>
<td>Meeting of the EAC in New York City</td>
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<td>December 13th</td>
<td>IAC discusses the EAC recommendations and forms subcommittees to examine opportunities for WPI in 5 key locations (Brazil, China, Russia, Singapore, Switzerland)</td>
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<td>January 13th</td>
<td>IAC discusses results of subcommittees research and assigns specific report sections to members</td>
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<td>February 1st</td>
<td>IAC subcommittee forms and meets with student focus group</td>
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<td>February 6th</td>
<td>IAC members attend Stern’s lecture on Global Education at WSU</td>
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<tr>
<td>February 13th</td>
<td>Dean Oates reports on Task Force progress to the President and Provost</td>
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<tr>
<td>February 15th</td>
<td>IAC reviews report section drafts and refines opportunities</td>
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<tr>
<td>March 6th</td>
<td>IAC discusses opportunities section and prepare for EAC</td>
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<tr>
<td>March 16th</td>
<td>EAC convenes on WPI campus</td>
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<tr>
<td>April</td>
<td>EAC and IAC draft the report to the President and Provost</td>
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Appendix III. Members of the Provost’s Task Force on the Globalization of WPI.

Internal Committee Members:
Chair: Karen Oates, Dean, Arts & Sciences
Diran Apelian, Howmet Professor of Mechanical Engineering
Stephen Flavin, Vice President, Academic & Corporate Educations
Arne Gericke, Department Head, Chemistry & Biochemistry
Art Heinricher, Dean of Undergraduate Studies
Chris Lambert, Professor, Bioengineering
Reeta Prusty Rao, Professor, Biology & Biotechnology
Mark Rice, Dean, School of Business
Jennifer Rudolph, Associate Professor, Associate Head for Humanities
Jerry Schaufeld, Professor of Practice, School of Business
Tom Thomsen, Director, International Students/Schools International House
Rick Vaz, Dean, Interdisciplinary and Global Studies Division
Amy Zeng, Associate Professor; Director, Operations and Industrial Engineering Program, Co-Director, China Project Center

External Committee Members:
Douglas Borden III ’96, Lead Associate with Booz Allen Hamilton
Steven Davi ’85, Senior Vice President of Advanced Technology and head of the office of the CTO for SeaChange International
Lubov Fajfer, PhD, advisor for the Europe and Eurasia bureau of the United States Agency of International Development (USAID)
David Johnson ’82, CEO and President of Jenne Distributors
Pascal Marmier, Director, Consul, for Swissnex Boston,
Marilyn Pifer, PhD, Associate Program Director of the Centers, Institution Building and Innovation at CRDF Global
Armen Orujyan, PhD, Founder and Chairman of the Board of Athgo Corporation
Martin Reiss, CEO and President of Rolf Jensen & Associates, Inc
Joan M. Szkutak ’79, Director, Household Care Research and Development, Procter and Gamble Company
Marc Tejtel, Deputy Chief Counsel of the Commercial Law Development Program (CLDP) of the US Department of Commerce in the Office of General Counsel
Paul Varadian ’75, Founder and CEO of ebook451.

Advisor
Michael J. Dolan ’75, Senior Vice President of ExxonMobil Corporation
Appendix IV. Faculty Voice on Current Global Engagements and Suggestion for Improving.

Faculty Comment 1:
Since my international collaborations are basically at the two Project Centers that I direct for the IGSD (Namibia & Hong Kong), one important way to help these two centers is to provide scholarships to deserving, qualified students to be able to participate in the Project Center program. At the moment some qualified students do not even apply for a Project Center program if it will require paying more than the regular tuition and fees associated with attending WPI, while other students who have been accepted to a Project Center program have to drop out because of financial problems. A scholarship fund that is competitive that would allow deserving and qualified students to take advantage of our Global Perspective Program would be a wonderful addition.

With regard to research, one way to enable me to be more deeply involved in carrying out research and/or getting research published would be to give me the time and money to work on this over the summer time, and also give the students who may have been involved in the research, for example for an IQP, the time to work with me to get research published. It would be great to work with the best IQP teams to get the results of their research published, but what typically happens is that students go away over the summer to get a job and earn money and thus are not available to work with me on getting their research into publishable form. After students return from their summer vacation, they are immediately immersed in WPI’s intensive academic schedule, and specifically for seniors, this means their MQP research project. Thus senior year is also not a time when students have extra time to work on getting their research ready for publication. And in fact, I am incredibly busy every term myself, so finding the time during the academic year to work on a publication is virtually impossible. I am teaching every term, and on top of that doing the work of a Center Director for two Project Centers and serving as an advisor for the Engineers Without Borders student chapter at WPI. If I want to do collaborative research with a partner organization such as the Desert Research Foundation of Namibia (DRFN), which I have tried to do in the past, I would need time and money to stay in Namibia to work with their researchers to get the research published. It is extremely difficult to accomplish this with me in the US and them in Namibia, as communication is not very easy, and also expensive. With regard to new research that we might collaborate on, obviously getting a research grant would be best, but then I would need the time to actually apply for and secure a grant to carry out the research, and in my field, anthropology, that would require extensive field work, and thus time away from the campus and teaching, which would require hiring someone to teach my courses and do my Center Director work while I am absent, or funding me to do the research over the summer, which is often too short a time period to carry out anthropological research. So it is complicated and probably not cheap.

Faculty Comment 2:
While money is ALWAYS welcomed, that has never really been the sticking point for my own collaborations. Instead, I have always looked for (and not found) support for this type of work from my department head. Or, even just for departmental support from my research. A few examples:  
- Several years ago, a foreign colleague offered to send one of his student's to WPI for free for a semester. We wanted to start some student exchanges between the schools. My department head saw no way to facilitate this exchange. The student would likely not enroll as a WPI student, so I was told that such students would not be permitted access to the building after regular hours. And, the exchange student would not be permitted to have any WPI keys (e.g., for my own lab), or sit in on any WPI classes. I think that this attitude has changed in the past few years, but the prior attitude certainly drove this student away.  
- I was offered a free summer intern by a student (and his faculty advisor) last summer. I turned
that down, since there was really no space in which to place a person. And, no general support for my research. In addition, WPI is not a fully supported environment during summers. I suspect that we have plenty of space in the building. But, space is frequently assigned based on concerns other than need/utilization. And, sharing space is not a strong point of this department. (I shared some of my own space, and the department gave that space to that other faculty member....) - I have had requests for my graduate student to go spend a semester at the lab of a colleague. Our students seem to have no interest or idea of how to do this. It is basically a "non-starter." - I have been told directly that my research is not supported by the department or by my department head.

Faculty Comment 3:
I do believe that the biggest problem to establish and run international collaborations is the lack of hosting facilities at WPI. Yes, just to have an apartment or a house properly furnished (with a place to sit to read a book for instance) with internet access would be the biggest thing WPI can do to help me to run my (already funded) international collaboration. Through the years I have developed an excellent working relation with the people from Student housing, so I have been able to get rooms in one of WPI's houses. But, it is almost embarrassing to put a foreign scientist in one of the WIPI's houses. So whenever I could I have hosted them in my house. Of course, my lab has a phone that we provide to these colleagues during their stay and at one point we had a mobile card for Internet. All from my own funding. Because I suspect (I am too old) that some people might be interested in exploratory trips. I want to express that I do not believe that is the role of WPI provide money for this. PIs should work, get recognized and then the collaborations will emerge. Moreover, there is external funding available for this purpose and people should go and compete for it. That is what happens in competitive Universities ;-)  

In short, WPI just has to provide the infrastructure for the whole community, not the incentive, motivation, or money for individuals.

With regard to research, one way to enable me to be more deeply involved in carrying out research and/or getting research published would be to give me the time and money to work on this over the summer time, and also give the students who may have been involved in the research, for example for an IQP, the time to work with me to get research published. It would be great to work with the best IQP teams to get the results of their research published, but what typically happens is that students go away over the summer to get a job and earn money and thus are not available to work with me on getting their research into publishable form. After students return from their summer vacation, they are immediately immersed in WPI's intensive academic schedule, and specifically for seniors, this means their MQP research project. Thus senior year is also not a time when students have extra time to work on getting their research ready for publication. And in fact, I am incredibly busy every term myself, so finding the time during the academic year to work on a publication is virtually impossible. I am teaching every term, and on top of that doing the work of a Center Director for two Project Centers and serving as an advisor for the Engineers Without Borders student chapter at WPI. If I want to do collaborative research with a partner organization such as the Desert Research Foundation of Namibia (DRFN), which I have tried to do in the past, I would need time and money to stay in Namibia to work with their researchers to get the research published. It is extremely difficult to accomplish this with me in the US and them in Namibia, as communication is not very easy, and also expensive. With regard to new research that we might collaborate on, obviously getting a research grant would be best, but then I would need the time to actually apply for and secure a grant to carry out the research, and in my field, anthropology, that would require extensive field work, and thus time away from the campus and teaching, which would require hiring someone to teach my courses and do my Center Director work.
while I am absent, or funding me to do the research over the summer, which is often too short a time period to carry out anthropological research. So it is complicated and probably not cheap.

**Faculty Comment 4:**

1. One of my Indian collaborators is at Yale this semester. It would be great to have him visit. Since I don’t live in Worcester, we would have to put him up in town. I doubt he has a US driver’s license, so we’d have to figure something out. I also could present opportunities for building on this relationship in India.

2. I am part of a research project that meets in Germany every 6 months over the next two years. They pay airfare and expenses for the meetings, and there are several ways to build on this opportunity. One is to present with colleagues from this workshop at a conference in Europe. A second is to give a talk and have meetings at the universities of the members of the research team. I could make a more specific proposal.

3. Resources for language learning. I’d be interested in hiring a conversation partner for one of the two languages at the center of my collaborations—German or Hindi.
Appendix V. Student Voices on Current Global Engagements and Suggestion for Improving.

Summary of a meeting of the GTF Student Advisory Group lead by IAC member Tom Thomsen

Student Government President Jean Paul Miralda was asked to participate in the GTF Student Advisory group. He agreed to ask for 4 – 5 volunteers among the SGA senators to serve as part of the group. In addition, Jean Paul brought up to specific suggestions for the committee to consider:

- Establish a Student Advisory Committee for IGSD similar to what currently exists for the Career Development Center. He was certain it would not be a problem to get students to volunteer for such a committee
- As a long term goal he suggested working towards having more global perspectives infused into the curriculum

On Wednesday, February 1, 2012 the Student Advisory Group met to discuss “Globalization at WPI”. The following SGA members participated: Pedro Jose Escuer; Marco Antonio Villar; Kevin Yiu; Dominick Calvao; Tushar Narayan and Jean Paul Miralda. In addition Aakriti Bhakri, the chair of the International Student Council, attended.

The meeting began with a discussion of the questions “What does ‘globalization at WPI’ mean to you?”.

- Getting image of WPI overseas
- Project centers, more in different regions (geographic diversity)
- More information sessions in countries overseas (student recruitment)
- Name recognition for the university abroad
  - “Even in California, WPI isn’t widely recognized”
- Attracting attention of global companies for job recruitment so students can be exposed to opportunities overseas, not just jobs available in the US

Students next discussed the “Overseas Hubs” idea from the Globalization Committee.

- Students were interested to hear how the “hubs” might work, but were not sure how individual staffers abroad would bring the hubs to life.
- Global diversity on campus

Ideas for globalizing the WPI campus

- Courses
  - Not many global options for classes → slowly getting better (Arabic course), but there could be more
  - There could be a requirement to take a “global” course before graduating
  - Another humanities/social science course cluster that is more global in nature, not just “international”
  - Actively infusing courses with international examples—such as reading case studies or papers from overseas scientists
  - GPS → make the “G” stand for “global” instead of “great” and add more global elements to the first half of courses

- Student groups/programming
  - Global programming—culture groups should work together more to promote programming that is open to the whole campus. Some culture groups seem very exclusive
- International Student Council is open to anyone, but many Americans don’t realize they can join.
- An International Food Festival would probably be a popular idea for a campus-wide program, students love free food, and it is a way to expose others to new things.
- Doing more culture club activities earlier in the academic year (A/B term) with free food/activities to set the tone for encouraging students to join programs and expect more global activities on campus.
- Encourage international students to join other groups around campus, not just the international ones.
- Soccom programs could connect with ISC or other groups to do campus-wide programs to draw larger crowds.
- Soccom could do more global events—quad activity last spring had a global theme with China and dragons. Reached a wide campus audience.

The meeting concluded with a discussion of “How realistic is it to change campus culture?”
- “It would have to be very gradual, but can be done slowly over time.”—student
- More global programming could be done in A Term to “set global tone” for the school year, get more freshmen involved.
- Orientation doesn’t convey an idea of diversity on campus—no time when all students introduced—when all sitting together, hard to know what the diversity is like.
- Suggestion of an extra day of orientation where American students are exposed to global issues while the international students are exposed to American issues.
- Engineering courses are harder to “globalize” than liberal arts courses.
### Appendix VI. Data on International Students, Faculty, Scholars, and Research at WPI

80 Countries are represented by International Students

<table>
<thead>
<tr>
<th></th>
<th>Undergraduate</th>
<th>Graduate</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number of International students (percent of total students)</strong></td>
<td>422 (11%)(^1)</td>
<td>545 (35%)(^2)</td>
</tr>
<tr>
<td><strong>Top 3 countries</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>China</td>
<td>156</td>
<td>China (367)</td>
</tr>
<tr>
<td>India</td>
<td>23</td>
<td>India (65)</td>
</tr>
<tr>
<td>Vietnam</td>
<td>22</td>
<td>Iran (12)</td>
</tr>
</tbody>
</table>

Data provided by the Office of Institutional Research

\(^1\)This number is out of a student body of 3746.

\(^2\)This number is out of a student body of 1557.
Appendix VII. Map of WPI’s current sites of international research and collaborations.
Appendix VIII. Summary of WPI Project Center Work

Bangkok, Thailand
WPI students work in project teams on IQPs sponsored by local nonprofit organizations, universities, and governmental and non-governmental organizations. Most projects will involve Thai students from Chulalongkorn University, providing an opportunity to work on a cross-national team. Projects are conducted on a wide variety of topics and are arranged in advance through resident coordinators in Bangkok. Most projects provide the opportunity to work with underserved communities, and some give students the opportunity to experience life in the countryside. Project themes and recent examples in each area are as follows: Health and human services - Improving the Bangkok Refugee Learning Center: An Assessment of the Current Program and the Development of a Computer Literacy Course; Community development - Tsunami Mitigation in Ban Nam Khem, Thailand: Assessment of Evacuation Towers, the Warning System, and Education and Training; Sustainable development and appropriate technology - Developing a Strategy to Improve Solar Home System Sustainability in Rural Thailand; and Environmental issues - Addressing Threats to Water Quality in Suan Phung Nature Education Park

Budapest, Hungary
Computer Science MQPs are conducted at the Computer and Automation Research Institute in Budapest (SZTAKI, http://www.sztaki.hu/). This Institute is the national research center in Hungary for information technology, computer science and their related fields. In addition to pursuing basic and applied research, system design and system integration, consulting and software development are also among the activities of the Institute. The Institute puts a special emphasis on education related activities; it is closely affiliated with several Hungarian and European universities, including the Budapest University of Technology and Economics (BME) and the Eotvos Lorand University of Sciences, Budapest (ELTE). Students live in shared apartments and the center is under the direction of Professor Gabor Sarkozy.

Cape Town, South Africa
This is an IQP project center for intrepid, hardworking students eager to help “make a difference” in South Africa. The Cape Town projects focus on sustainable development in informal settlements where many people live in shacks and without adequate provision of basic services. Recent projects include an exciting set of integrated projects focused on helping one informal settlement realize the goal of transforming their squatter camp into a socially and ecologically sustainable “ecovillage.”. Students have created website (www.wpi-capetown.org) describing team projects and setting forth a core redevelopment strategy: to “grow” change in small, incremental steps that maximize public and private benefits, maintain and strengthen local social networks and decision-making, create jobs, training and leadership development opportunities, and build the foundation for a healthier community going forward. Students reside in a casual “backpacker” inn and are under the guidance of Professor Scott Jiusto.

Copenhagen, Denmark
IQP projects in Denmark span a wide range of topics, with an emphasis on environmental issues and technology for people with disabilities. Alternative transportation, food quality, and technology to assist visually impaired people with disabilities are all topics of great interest to both the public and private sector. Not-for-profit agencies are also expected to sponsor several future projects. Students live in shared apartments and the center is under the direction of Professors Peder Pedersen & Tom Thomsen.
China (various cities)
This is an MQP project center with multiple projects spanning many disciplines – CS, ECE, IE, ME MGE, MFE, RBE). These MQPs will be conducted at one of the three universities, usually with 2-3 trips to other cities. WPI students will work with Chinese students from one of the universities in mixed teams, with co-advisors from both WPI and the university. These projects are real world problems and are sponsored by global companies with China operations, such as UTC, Caterpillar, and Amphenol TCS, and institutions in the areas of mechanical product and system design, robotics, manufacturing processes, environmental engineering, supplier chain management, and lean manufacturing implementations. Information on previous projects can be found at http://www.me.wpi.edu/Research/CAMLab/mqpinchina/index.htm. Students reside in shared apartments under the supervision of Professor Yiming (Kevin) Rong and Professor Amy Zeng.

Hong Kong, PRC
This center provides IQP opportunities. In Hong Kong WPI works with a number of educational, social service, policy and environmental organizations and institutions. Hong Kong University of Science & Technology, Hong Kong Polytechnic University (HKPU) and Lingnan University have sponsored projects, while other sponsors have included Friends of the Earth, Hong Kong Council of Social Service, Caritas Francis Hsu College, Caritas Charles Vath College, Worldwide Fund for Nature (WWF), Designing Hong Kong, Jets Technics, Hong Kong Maritime Museum and the Hong Kong History Museum. New sponsors are sought on a regular basis. In general, IQPs will deal with urban planning, a greener environment, sustainable resource use, education reform and innovation, economic and social issues, and other topics as appropriate. Examples of past projects include an evaluation of an English language educational software program developed to help Chinese students improve their writing skills, evaluating how to increase recycling of beverage containers and vehicle tires and identifying how to reduce light pollution. Students reside in shared apartments under the supervision of Professor Peighton Creet.

Ifrane, Morocco
The worked performed at this project center can either conclude the Humanities & Arts Requirement or can be credited toward a Humanities and Arts or International Studies minor or major. Students take two mini-courses at AUI for one-third unit on the Arabic language, the history of the Arab World and Islamic Civilization, and/or contemporary issues in North Africa. For another third unit, students write an informed memoir about People and Places they visit on educational excursions to historical cultural sites such as Marrakesh, Casablanca, the Sahara…. The final one-third unit Humanities and Arts project can be written in a variety of areas including history, religion, art and architecture, foreign languages, as well as contemporary socio-political issues. Studying with Moroccan classmates and traveling to legendary Moroccan locales provides students with a greater understanding of Arab and Muslim peoples. Students live in residence halls at Al Akhawayn University and are under the supervision of Professor Bland Addison and Professor Tahar El-Korchi.

Limerick, Ireland
Projects involve working at local electronics firms and research facilities. Students spend 9-10 weeks in Limerick, working fulltime in collaboration with local engineers on the projects. MQPs in Limerick typically focus on signal processing and wireless communications, digital design and embedded systems, software engineering, and analog and mixed-signal hardware design. Specific project descriptions are not available until the beginning of the projects, as project sponsors typically provide the opportunity for students to work on cutting-edge problems of immediate interest to the sponsors. Past projects have included design of a wireless medical monitoring system for the University of Limerick, and
research and development for infrared-to-digital converters for Analog Devices B.V. Students reside in shared apartments under the supervision of Professor Robert W. Lindeman.

London, England
Sustainable development is at the intersection of environment, economy and social equity. Student teams work with local governments and/or NGOs on strategies to encourage recycling, and increase the use of renewable energy and they work with the disadvantaged on community development. An equally large share of project activity supports education and outreach activities at famous museums, such as the Tower of London, the British Museum, and the Museum of Science. The London Center projects challenge students with important problems that make a real difference to the project sponsors and the citizens they serve. Students live in double dormitory-style rooms under the supervision of Professor Dominic Golding and Professor Robert Krueger.

Melbourne, Australia
Projects at this site focus on disabilities, fire protection, education or the environment. Students reside in shared apartments under the supervision of Professor Holly K. Ault.

Osaka, Japan
Computer Science and IMGD MQPs in the Kansai area will be conducted at Osaka University, a leading engineering university. Current projects will involve work in the areas of interactive information systems (e.g., public displays) and other "Cybermedia" applications, and will be conducted within various departments at the university. Specific project descriptions will be available in the first half of 2012. This will give participants a much richer experience in Japan, and allow the teams sufficient time to produce outstanding work. Students reside in shared apartments under the supervision of Professor Robert W. Lindeman.

Nancy, France
The MQP (CHE, EVE) projects will be done in collaboration with l’Ecole Nationale Supérieure des Industries Chimiques (ENSIC), which is comprised of five separate laboratories: Laboratoire de Chimie Physique Macromoléculaire (LPCM, Physical Chemistry of Macromolecules), Département de Chimie Physique des Réactions (DPCR, Physical Chemistry of Reactions), Laboratoire de Thermodynamique des Séparations (LTS, Thermodynamics and Separation Processes), and Laboratoire des Sciences du Génie Chimique (LSCG, Chemical Engineering Sciences). Projects are chosen based on consideration of the interests and majors of the applicant students. Typically, we have a project in polymeric drug delivery/nanoparticles, biofilms in bioreactors, and in development of fuel cells. Examples of past project titles include “Polymer Stabilized Emulsions for Drug Delivery” and “Biofilm Development and Characterization”. Students reside in shared apartments under the supervision of Professor Terri Camesano.

Panama City, Panama
MQP (EV, CEE) Projects will be completed in the Environmental and Civil Engineering areas. Sponsors will include various government and private organizations in Panama City. For example, the Autoridad del Canal de Panama may have opportunities linked to the Panama Canal Expansion Program, an 8-year multi-billion dollar project to deepen the canal entrances, deepen and widen the channels, and install water saving basins at the locks. Other environmental projects may be coordinated through SENACYT, the national organization for Science, Technology and Innovation. These may include environmental clean up on Coiba Island, among others. In the civil engineering area, projects in transportation, construction and infrastructure development may be available through Constructora Urbana (CUSA), a
leader in the construction industry in Panama. Students live in apartments or apartment-style villas under the supervision of Professor Jeannine Plummer.

**San Jose, Costa Rica**

IQP Projects are typically in environmental issues. Costa Rica’s unique environment provides students opportunities to focus on environmental conservation and sustainable development by working with government agencies dedicated to those issues and with selected museums and private organizations. Students will become very familiar with the land and with the challenges of maintaining a clean environment in spite of pressures to develop the economy. Prior knowledge of Spanish language is not required for participation. All students, however, complete a two-week intensive language program on site. Those who have some Spanish skills will greatly improve them. Students reside in shared units in a residential hotel under the supervision of Professor Jeannine Plummer.

**San Juan, Puerto Rico**

IQP Projects are completed in teams and span a wide variety of topics including the environment, public health, housing, social welfare, transportation, and land use. We focus heavily, by design, on issues of sustainable development. Sponsoring agencies have included many offices of the government of the commonwealth as well as local industries. Students reside in shared apartments under the supervision of Professor Susan Vernon-Gerstenfeld.

**Venice, Italy**

Since its founding in 1988, the IQPs at the Venice Project Center provide an opportunity for students to see the implementation of their projects for the benefit of an entire city. Projects are conducted for Venetian, American and international organizations and include environmental, socioeconomic, artistic, cultural, and technical concerns important to the revitalization of this historic city. The 130+ projects completed in Venice include: in-depth studies of the Canals of Venice that resulted in the publication of a book under the auspices of UNESCO; a number of projects on the preservation of Venetian art; several environmental studies on the lagoon ecosystem that contributed to the creation of an online Lagoon Atlas; a groundbreaking DNA study of the origins of the Veneti, in collaboration with National Geographic, and a re-engineering of the Venetian cargo delivery system and the design of a vacuum sewer system to prevent discharges into the city’s canals. Current projects are focusing on mobile and internet technologies to allow local citizens and visitors to enjoy the city in a more intimate and personal way. Students live in shared apartments under the supervision of Professor Susan Fabio Carrera.

**Windhoek, Namibia**

Namibia’s well-developed government and non-governmental agencies at both the national and municipal levels will sponsor most of the IQP projects, and these projects will generally focus around issues of sustainable development. Private sector organizations may also sponsor projects. In particular, projects typically investigate alternative energy sources, improved water and sanitation management, improved health and education, low-income housing, micro-level income generating activities and tourism development. Local towns and peri-urban informal settlements will be the venue of some of the projects. No prior knowledge of Africa is needed, but the preparation will include a heavy commitment to learning about the culture of Namibia in addition to preparing specifically for the projects. Students live in shared rooms in a Bed and Breakfast under the supervision of Professor Creighton Peet.
Appendix IX. Detailed report on 5 Hubs

Brazil as a Hub (prepared by Dean Karen Oates and Dr. Tara Mann)

Background

Brazil is the largest country in South America and the fifth largest country in the world in terms of both size and population. Brazil is the only Portuguese speaking country in the Americas. It has one of the world’s fastest growing economies and has experienced a bout of rapid urban growth. As of 2005, 81% of the countries 190 million people live in urban centers. While this presents great opportunities and has aided in the economic growth of the country, it also presents a number of social, environmental and political problems for the major urban areas.

Brazil has been a federal republic since 1985 holding presidential elections every four years. The Brazilian economy faiired well during the 2008 economic crisis and has shown a rapid recovery. Experts predicted continued strong performance and movement of Brazil from its position as the world’s seventh largest economy to the fifth within the next few years. This growth has contributed to Brazil’s transition from a regional power to a global power.

Relations between the United States and Brazil have been very strong for years and have been reinvigorated after President Obama’s visit in 2011. There are 10 major agreements in place between the countries and many other engagements. For example, in the next 5 years the government will select 20,000 Brazilian students for participation in exchange programs with the US. With its economy growing, low unemployment, and a focus on innovation, many opportunities exists for WPI’s engagement with a country growing in its global stature.

Map

http://www.state.gov/r/pa/ei/bgn/35640.htm
**Business**

Brazil encourages foreign investment with the largest foreign investor being the United States. To continue attracting foreign investment, Brazil plans to expand its own investments in offshore oil, nuclear power and infrastructure. In preparation for hosting the 2016 Rio Olympics, major improvements in transportation, roads, airports and sport facilities are expected.

A large component of the Brazilian economy is agriculture. Brazil experiences a significant positive trade balance in this area and is the world’s largest exporter of sugarcane, coffee and orange juice and has the world’s largest cattle herds. Forty percent of Brazil is covered in rainforest and significant efforts at conservation have resulted in a 70% decrease in deforestation. However, environmental issues around deforestation and a balance with agricultural expansion it is still a serious problem. The Brazilian government is putting serious effort into the development of sustainable programs around the management of the rain forest and into the development of renewable energy sources and energy efficiency. Overall, Brazil is considered a regional leader in science and technology but a global leader in the specific areas biofuels, agricultural research, deep-sea oil production and remote sensing.

According to the US State Department, extensive ties exist between the governments, the private sector and academic researchers. These ties are particularly strong around biofuels, medical research, remote sensing and agriculture. These ties are expected to strengthen and potential areas of growth include advanced materials, telecommunications, and energy. Limiting this growth are restrictions on foreign researchers’ work with biological materials. There is fear of biopiracy, the unauthorized taking and commercialization of genetic resources or the traditional knowledge of indigenous peoples.

**Higher Education**

The Federal Government through the Ministry of Education regulates the educational system in Brazil. At the level of higher education, both public and private universities are found but the consensus is that the government funded public institutions provide a much better education. Improving the state of higher education in Brazil is a priority of the government.

A number of research centers exist that produce world-class research and research output that places Brazil 13th in the world. However, when the number of students trained and the research output is put in terms of the population, Brazil falls short of many developed countries. For example, in Switzerland there are 23 doctors for every 1000 patients between the ages of 25 and 64. In the US, there are 15.4 in Germany, and 8.4 in the US. Brazil has only
1.4 doctors. Similar or even more pronounced deficiencies are seen in terms of engineers and other technical fields. A significant problem with improving the situation is a lack of qualified teachers and significant disparities in the population with opportunities to attend the institutions. However with strong economic growth and a recognized need for improvement, Brazil is poised to expand its higher educational system and significant opportunities exist for the engagement of US universities.

**Current WPI connections**

Currently we do not have a footprint in Brazil. Our first exploration was with President Berkey and will be followed by faculty attending BIO2012 and exploring the opportunities while attending this large gathering.
China as a hub (prepared by Drs. Jennifer Rudolph and Amy Zeng)

Background

China’s economic, security, and educational importance has increased exponentially in the last 2 decades. As direct and indirect results, China-related activities at WPI have also increased in recent years. Currently, WPI has devoted sufficient attention and resources toward China to warrant further concentration and the establishment of a hub and/or a center.

Moreover, President Obama and President Hu Jintao’s 2009 100,000 Strong Initiative indicates the high stakes both governments view as involved in bridging the language and cultural barriers that divide the two economic and military giants. And it makes money available from both sides.

In short, a critical mass of China-related activities and initiatives exists on campus that warrants examining the benefits of establishing a China Center and/or Hub to coordinate and expand these efforts in order to facilitate greater collaboration with Chinese partners and greater WPI presence in China. The desire for greater industry collaboration further reinforces the value of establishing a China Hub and/or Center.

Map

http://www.travelchinaguide.com/map/
Higher Education

China has the largest education system in the world with over 2000 universities in existence. According to the China Education Center, in 2010 there were 2305 Higher Education Institutions (1090 Universities, 322 independent colleges, 1215 non-university higher education institutions, 384 higher education institutions for adults). Since 1978 the number of students moving through the higher education system has increased from 1.4 percent of the population to 20 percent (ref - China educenter) with the total number of enrollment in these institutions just over 26 million in 2010. The total enrollment for graduate students was 1.1 million with the majority being master’s degree candidates.

In recent years there has been a push by the government to consolidate many of the smaller universities and to build the international reputation for the country’s higher education institutions. The government has targeted 10 universities as elite university and actively promotes growing international prominence for these institutions. The top 10 “elite” schools include Tsing Hua University, Peking University, Fudan University, Zhejiang University, Wuhan University, Nanjing University and Renmin University of China.

In the last 20 years, China’s interactions with foreign institutions have grown tremendously. They have established exchange and cooperatives with 154 countries and sent hundreds of thousand of students aboard to over 100 foreign countries. In addition, China has been increasingly accepting students and teachers from foreign countries into their universities. With the dramatic increases in the number of students moving through China’s educational system and studying aboard, many foreign institutions have looked for ways to partner with China. For example, a 2007 survey revealed the 24% of American graduate schools had established one or more degree programs with Chinese Universities and a growing number of joint degree programs are being offered (there were 1300 such programs in 2006).

WPI connections in China

WPI has responded to the increased importance of China to the US economy, security, and engineering scene. Over the past decade, faculty and staff have devoted much effort to building an MQP presence in China, with key support coming from Professors Kevin Rong (Mechanical Engineering), Amy Zeng (Business), David DiBiaso (Chemical Engineering), and Susan Zhou (Chemical Engineering). Professors Rong and Zeng have established MQP sites in Beijing, Wuhan, and Shenzhen primarily; while Professors DiBiasio and Zhou have students working in Shanghai. Numbers indicate the interest; approximately 25 students go to China each year for their MQP projects. Another 25-28 go to Hong Kong for their IQP experience at the well-established Hong Kong Project Center. IGSD is looking to increase its project sites, and
mainland China is among the possibilities. On campus, HUA started offering Mandarin this year as only the 3rd language offered at WPI (Arabic was also added as a fourth). Despite being added during the summer, the Chinese class filled up literally overnight, and a second section, which also quickly filled, was added. Even before Mandarin was being offered on campus, approximately 50 WPI undergraduates traveled to China in each of recent years for project work. In addition, inquiry seminars on China have regularly filled since their establishment two years ago.

**What might we do?**

There is momentum at WPI for building a greater presence in China. With the multiple MQP Centers in place, there is multi-disciplinary presence. With Kevin Rong and Diran Appelian’s national professor and visiting distinguished professor posts, respectively, high-level university connections have been forged. With Amy Zeng’s business and industry connections and with the Business School’s China initiative, there are joint programs in the works with Chinese universities and active collaboration with industry. A hub with its more virtual reach could facilitate the types of industry collaboration that would further the goals of various institutes on campus, such as the Metal Processing Institute and the Bioengineering Institute. It could also facilitate furthering WPI’s influence in more strictly academic realms through research collaborations with industry. While a hub model is promising for global reach and positioning especially with industry, because of the importance of China to on-campus education and research, a center should also be explored.

**Short Term Recommendations**

- Form a WPI-China Advisory Board and Committee
  - Build on the current WPI collaborations
  - Coordinate campus efforts for collaboration, outreach, programs

The emphasis on China puts WPI in an enviable position in terms of meeting US funding agencies’ priorities. WPI can pair STEM and Business education with expertise in a strategic partner. By globalizing our undergraduate curriculum through emphasis on China, we position our undergraduates to meet the global challenges of the 21st century with knowledge of our, arguably, most important trading and research partner. To this end, Amy Zeng (PI, Business), Kevin Rong (co-PI, ME), and Jennifer Rudolph (co-PI, HUA), established the US-China Link@WPI through support from a US Department of Education Business and International Education grant (2009-2011) to formalize the Beijing/Wuhan/Shenzhen MQP Center, hold China conferences on campus, and bring speakers to campus for a China series. Building on China
connections, the Business School is actively exploring entrepreneurship in China, and Prof. Zeng will be submitting a second BIE grant for that purpose. Professor Rudolph, along with Professors Kristin Boudreau (HUA) and Jennifer deWinter (HUA) is working on establishing a China Path within the HUA Requirement and a China Track within the overall WPI curriculum as a way to formalize options for students desirous of globalizing their education at WPI while developing expertise on China. She is submitting a Department of Education Undergraduate and International Studies Foreign Language grant proposal to this end.

These efforts are presented as an indication of the work already being done on campus to expand WPI’s presence in China and its curriculum in a way that assists the goals of globalizing undergraduate education on campus. They can serve as a foundation for greater collaboration with Chinese universities, and just as important, can help in establishing the depth on campus necessary for greater inter-department collaboration that can result in stronger grant applications to such agencies as the NSF.

Formation of a WPI-China Link Advisory Board and Committee would provide the necessary structure to strategically build on these relationships.

**Long Term Recommendations**

Establish a China Center
- Facilitate connections
- Enhance funding opportunities
- Expand IQP/MQP opportunities
- Connect with Alumni
- Establish a clearinghouse for media and outreach

A China Center can help coordinate the various efforts on campus to establish connections to Chinese universities that result in meaningful research collaboration and fruitful intellectual exchange. Another potential benefit of a Center is that it can provide a focal point for private funds. WPI has a growing Chinese student body and many Chinese alumni. With the economic take-off in China, mores are changing and new customs being established. The idea of giving back to society and one’s school is a relatively undeveloped concept in China, but it is one that is beginning to take hold. It could be beneficial to WPI in many areas to more actively cultivate ties to Chinese alums. A Center could be a focal point for those efforts with potential to benefit many disciplines and areas of intellectual endeavor. Ways, as examples, to do this would be to highlight prominent Chinese WPI alumni who have made great contributions to Chinese society already or invite alumni working in China to campus.
A Center could also help identify areas that could contribute to and benefit from greater collaboration with Chinese partners, both university and industry. Researchers would benefit from introductions and facilitation that would present opportunities and partner priorities otherwise not known or logistically too difficult to individually navigate. Some potential areas for collaboration with Chinese partners (industry or academic) are robotics, IMGD and gaming, environmental studies, metal processing, professional writing, fire protection, life sciences, and biotechnology. In addition to the research and applications, another result of such collaboration could be the establishment of a more traditional type of internship program for students. (This type of internship, however, often requires language skills--reinforcing the need for Mandarin on campus).

In addition, a Center could also facilitate outreach to K-12 teachers, establishing WPI as the place to go for engineering and science if you want to also attain understanding of China and Chinese, thereby helping to establish a pipeline of more globally oriented incoming students. It could also serve as a clearinghouse for information that WPI has on China already: case studies, working papers, conference proceedings, as well as sponsor newsletters, social media, and speakers to campus.

In short, a critical mass of China-related activities and initiatives exists on campus that warrants examining the benefits of establishing a China Center and/or Hub to coordinate and expand these efforts in order to facilitate greater collaboration with Chinese partners and greater WPI presence in China. The desire for greater industry collaboration further reinforces the value of establishing a China Hub and/or Center.
Russia as a Hub (prepared by Marilyn Pifer and Dean Karen Oates)

Background

Russia has a population of 145 million, extensive natural resources and a rapidly growing economy. The emphasis on higher education, science and technology in particular, provides fertile ground for WPI.

Longstanding emphasis on scientific achievement led to the Soviet Union claiming the worlds’ largest scientific workforce. With the collapse of the USSR, science also collapsed, with many researchers in the prime of their careers leaving Russia or leaving science. 20 years later the scientific legacy is rebounding, with increasing emphasis on utilizing science and technology for economic growth. Innovation receives increased attention as a new generation with a full appreciation for intellectual property comes of age. A huge project to develop “Russia’s Silicon Valley” at Skolkovo in the Moscow region is expected to absorb $4 billion over the next two years; a new graduate university, school of management, and five “clusters” focused on energy efficiency, nuclear technology, IT, biomedicine, and space and telecommunications are intended to draw Russia’s best minds along with significant foreign participation and investment.

Map

http://www.worldatlas.com/
Business

Forbes magazine lists the top 10 cities doing business in Russia to be (from #1 to #10): Krasnodar, Khabarovsk, Yekaterinburg, Chelyabinsk, Novosibirsk, Omsk, Rostov-on-Don, Samara, Sochi, and Krasnoyarski. Moscow and St. Petersburg, the two main cities, were excluded from the survey; these two cities continue to dominate the commercial scene and would skew the rankings.

Numerous US companies are active in Russia. There are over 220 members of the US-Russia Business Council, including the U.S. and international giants Alcoa, Amgen, Apple, Boeing, Cargill, Chevron, Cisco, ConocoPhillips, Dow Chemical, DuPont, Exxon Mobil, Ford, General Electric, General Motors, Google, Eli Lilly, Microsoft, Pfizer, Raytheon, Research in Motion, Schlumberger, United Technologies, and Xerox.

Higher Education

Education in Russia is provided overwhelmingly by the state and regulated by the Ministry of Education and Science. There are regional authorities as well, each need to be involved as WPI contemplates engagement with the higher education community. Private institutions account for less than 2 percent of total higher education. Male and female students have equal shares in all stages of education except tertiary education where women are at 57 percent of the population.

Historically, (civilian) tertiary education is divided between “classical” universities with a traditional wide curriculum, technical” universities emphasizing science and engineering, and other, more narrowly specialized institutes such as the Gerasimov Institute of Cinematography. Some of the specialized universities have in recent years been agglomerated into Federal Universities in each of Russia’s seven Federal Districts. A new designation of “Research University” has been bestowed on 29 universities just in the past five years. This is significant, as during the Soviet period, universities did very little research at all. The Institutes of the Academy of Sciences had a near hegemony on basic and some applied research, with industrial installations carrying out applied research. A new Association of Leading Universities in Russia, to which all the Research, Federal, and “Special Status” universities belong, aims to be the equivalent of the Association of American Universities.
Traditional Russian higher education degrees were the 5-year Specialist degree (roughly a BS or BS+MS), a 2-3 year Candidate of Science (somewhat less than a PhD, though often considered equivalent), and the advanced Doctor of Science, generally achieved following a significant body of research 10 or more years past the Candidate degree. Russia is in the process of migrating to a BS-MS-PhD system through the Bologna process, although new PhD degrees, like the old Kandidats, are still generally earned after only three years, and DScs are still awarded. Kandidat/PhD, and DSc degrees are frequently earned not in a university but at a research institute of the Russian Academy of Sciences.

The laboratory facilities in universities and research institutes vary greatly in equipment and support. Some universities have state-of-the-art equipment and laboratories; many renovations have taken place in recent years with the recent acceptance of research as a legitimate function of the university and the drive to reap economic benefit from the government’s investment in science. Universities not in the list of leading universities are likely to have more Spartan laboratories and little research.

Current WPI Connections to Russia

When the WPI faculty was surveyed, only one member of the faculty Vadim Yakovlev responded with individual collaboration at both Saratov State Technical University and Perm State University looking at various mathematical aspects of microwave imaging and material parameters. Since then, Provost Overström and Department Head of Humanities & Arts have explored IQP connections with the partner museum in Moscow to our Clinton, MA Russian ICON Museum.

What might we do?

Short Term Recommendations

Set up IQP around the Moscow ICON museum linked to Clinton museum

Explore MQPs in the areas of business and engineering working with Mikromachina, the Russian branch of Nypro

Explore HUA projects in the areas of art and arts entrepreneurship
Long Term Recommendations

Engage a strong regional university with an international outlook for student and faculty involvement. One strong possibility would be Ekaterinburg’s Urals Federal University, formed in 2010 from the merger of Urals State University and Ural State Technical University. The Ekaterinburg region is known for metallurgy, and UFU has significant research strength in materials science, one possible field for an IQP.
Singapore as a Hub (prepared by Dr. Christopher Lambert)

Background

Singapore was founded as a British trading colony in 1819. It joined the Malaysian Federation in 1963 but separated two years later and became independent. Singapore subsequently became one of the world's most prosperous countries with strong international trading links (its port is one of the world's busiest in terms of tonnage handled) and with per capita GDP equal to that of the leading nations of Western Europe. The country of Singapore is just over 3.5 times the size of Washington, DC.

Map


Business

Singapore has a highly developed and successful free-market economy. It enjoys a remarkably open and corruption-free environment, stable prices, and a per capita GDP higher than that of most developed countries. The economy depends heavily on exports, particularly in consumer electronics, information technology products, pharmaceuticals, and on a growing financial services sector. Real GDP growth averaged 7.1% between 2004 and 2007. The economy contracted 1.3% in 2009 as a result of the global financial crisis, but rebounded nearly 14.7% in 2010, on the strength of renewed exports. Over the longer term, the government hopes to establish a new growth path that focuses on raising productivity, which has sunk to 1% growth per year in the last decade.
Singapore has attracted major investments in pharmaceuticals and medical technology production and will continue efforts to establish Singapore as Southeast Asia's financial and high-tech hub.

Based on information Singapore Economic Development Board, Singapore is:

- ranked first in the world as the city with the best investment potential.
- among the top 3 in foreign trade and investment.
- ranked first for having the most open economy for international trade and investment.
- the world’s easiest place to do business.
- Asia's most "network ready" country.
- ranked 2nd in the world and 1st in Asia for having the best protection of intellectual property.
- least bureaucratic place for doing business in Asia.
- ranked 7th in the world and 1st in Asia for having the least corruption in its economy.
- among the top 3 in Asia for having the most motivated workforce.
- Asia's best country to work in according to a survey of foreign talent.
- the first choice for Asian expatriates.

**Higher Education**

Singapore has a strong educational system as indicated by its identification as one of the world’s best performing school systems in a 2010 McKinsey report. In the 2011-2012 World Economic Forum Report on Global Competitiveness, Singapore was ranked 2 out of 142 countries in the quality of its higher education system and ranked 1 out of 142 countries for the quality of its math and science education. English is the language of instruction with all students also learning a second language.

A list of full universities and colleges in Singapore include: National University of Singapore, Nanyang Technological University, Singapore Management University, SIM University, Singapore Institute of Technology, and Singapore University of Technology and Design. Combined these universities have a student body of about 90,000. Of these the National University of Singapore and Nanyang Technological University are by far the largest. Both are research universities with student populations approaching 30,000 each.

In addition, there are a number of smaller private institutions including 15 polytechnic institutes with about 15,000 students each. Twenty seven institutions provide foreign university degrees and 7 foreign universities have satellite campuses in Singapore including Temple
Current WPI Connections to Singapore

The Global Task Force is not aware of any current WPI connections with Singapore.

What might we do?

Short term recommendations

Utilize the relationships with Joan Szutak (see bio below) and Proctor & Gamble (P&G). P&G already operates in Singapore and they have relationships with universities that could potentially serve as an entry point. The approach may be to request a brief description of five projects that P&G currently have an interest in and determine if these projects could be accelerated or expanded through involvement of WPI.

Build on Chris Lamberts’ collaborations with the University of Wales. The University of Wales already has a presence in Singapore. Professor Lambert works with Dylan Jones-Evans who has agreed to introduce representative from WPI to his contacts in Singapore.

One example might be work with the Management Development Institute of Singapore (MDIS). MDIS, founded in 1956, is Singapore’s oldest not-for-profit professional institute for lifelong learning. MDIS has two main subsidiaries: Management Development Institute of Singapore Pte Ltd (MDIS Pte Ltd) to oversee its Singapore academic operations, and MDIS International Pte Ltd to further its globalization strategy.

MDIS provides well-accredited courses, seminars and management services and opportunities for individuals to develop professionally through academic programs in Business and Management, Engineering, Fashion Design, Information Technology, Life Sciences, Mass Communications, Psychology and Travel, Tourism and Hospitality Management. They are offered in collaboration with highly acclaimed universities in Australia, France, the United Kingdom and the United States of America.
Switzerland as a Hub (prepared by Pascal Marmier and Dr. Jerry Schaufeld)

**Background**

Switzerland is a federal republic consisting of 26 cantons, with Bern as the seat of the federal authorities. The country is situated in Western Europe where it is bordered by Germany to the north, France to the west, Italy to the south, and Austria and Liechtenstein to the east. The population is 7.6 million people.

The Swiss Confederation has a long history of neutrality—it has not been in a state of war internationally since 1815—and did not join the United Nations until 2002. It pursues, however, an active foreign policy and is frequently involved in peace-building processes around the world. Switzerland is also the birthplace of the Red Cross and home to a large number of international organizations, including the second largest UN office. On the European level, it is a founding member of the European Free Trade Association and is part of the Schengen Area—although it is notably not a member of the European Union, or the European Economic Area.

Switzerland comprises three main linguistic and cultural regions: German, French, and Italian, to which the Romansh-speaking valleys are added. The Swiss, therefore, though predominantly German-speaking, do not form a nation in the sense of a common ethnic or linguistic identity. The strong sense of belonging to the country is founded on the common historical background, shared values (federalism, direct democracy, neutrality) and Alpine symbolism. The establishment of the Swiss Confederation is traditionally dated to 1 August 1291; Swiss National Day is celebrated on the anniversary.

Swiss research and innovation system is characterized by its very strong scientific and technological production that outperforms most countries in the world. A high level of R&D, an excellent education system, investment coupled with an efficient allocation of both private and public R&D resources result in scientific and technological outcomes of ultimate quality.

**Map**
**Business**

Switzerland hosts more than 800 North American companies, which use the country as a springboard to enter European markets. Most investors are fast growing small and medium-sized enterprises to which Switzerland offers the kind of competitive and liberal business environment needed to succeed today.

Various industry clusters of international significance have formed in Switzerland. These are networks of producers, suppliers, research facilities and services providers along a single value chain that are located close to one another. This is supported by the excellent research and development environment, the efficient registration and certification system, and a workforce that is extremely well qualified, with both technical experience and handling multiple languages.

A list of the advantages of working in Switzerland includes:

- Well-located strategically; stable and dependable relationship with Europe
- Political and economic stability, international integration
- Exceptional quality of life
- Leading technology center and skilled workforce
- Strong intellectual property laws
- First-class infrastructure
- Strong financial center and modest tax burden
- Business clusters that are global leaders
- Quick and easy company formation
- Professional support during the location process (Advisory services, tax relief and potential sources of financial assistance)
- Springboard to European market for US companies

A summary of key industries in Switzerland includes the following:

- **Clean technology**: Switzerland has become a world leader in the development of environmentally friendly technology and systems for efficient energy use. In particular, it is a leader in carbon dioxide emissions reduction and recycling.
- **Automotive supply industry**: There is a network of highly specialized suppliers of components ranging from precision and micro-mechanics to material technology and plastics and even the textile industry.
- **Infrastructure**: Many specialized Swiss companies, acting as niche players, produce small but essential products and services for infrastructure projects in areas such as
building systems, control systems, construction supply, energy conservation, water supply and railways.

- **Healthcare sector:** The Swiss healthcare system, which has excellent specialists and world-famous top hospitals and medical institutions, is among the best in the world. There is ample growth potential for healthcare services.

- **Life sciences, chemicals and pharmaceuticals:** The density of biotech companies in Switzerland is unique in the world. The companies in this field range from large multinational corporations such as Novartis and Roche to innovative startups.

- **Medical technology:** Research investment, growth rates and profitability are higher than average in the Swiss medical technology sectoring, which includes companies such as Synthes and Sonova.

- **Financial services:** Switzerland, home to the major international banks UBS and Credit Suisse, is one of the world’s key financial centers. Machinery, electronics and metals industries: With companies like ABB and Schindler, Switzerland is one of the world’s leading industrial centers in almost all sectors in terms of export volumes.

- **Luxury watch industry:** The watch manufacturers based in Switzerland (including companies such as Swatch and Rolex) have increased their market share to over 50% in recent years.

- **IT:** Switzerland is very advanced in the area of information and communication technologies. Siemens, EDS Corporation, Dell, HP, Reuters and Orange are a handful of the major employers.

- **Commodity trading:** As a historical hub between many different trading routes and a major financial center today, Switzerland is one of the most important trading centers for commodities.

- **Headquarters:** Switzerland is the location of a growing number of global or regional headquarters for foreign corporations such as IBM, Kraft Foods, Philip Morris and Google.

**Higher Education**

The Swiss education system is decentralized, with responsibilities shared primarily between the cantons and municipalities. The 26 members of the Swiss Conference of Cantonal Ministers of Education ensure the coordination of the primary and secondary education system. Higher education is generally a joint cantonal-federal responsibility.

Switzerland has three levels of education: primary, secondary and tertiary. The primary and lower secondary levels are compulsory, and together usually take nine years. This is followed by post-compulsory education (upper secondary level). Switzerland operates a “dual system”: 
students can opt for either the vocational education and training route (apprenticeship) or for the general academic one, which will prepare them for the Matura (Swiss baccalaureate) and ultimately attendance at university. A list of Swiss institutions of higher learning includes 2 Swiss Federal Institutes, 10 Universities, and 7 Universities of Applied Sciences.

**Current WPI connections to Switzerland**

WPI has many current connections to Switzerland. Faculty connections include Professor Diran Apelian and Professor Jerry Schaufeld. Professor Apelian is a consult and teacher at ETH-Swiss Federal Institute of Technology in Zürich. Jerry Schaufeld is actively involved with Swissnex Boston, Swiss CTI and has hosted MBA students at WPI. In addition he has given several guest lectures at XXX and is co-author of along with a Swiss colleague of a text on Commercialization. WPI has a Memorandum of Understanding with the Zurich University of Applied Sciences and will host a visiting scholar and graduate student. In addition, WPI faculty collaborate with an economic development team in Basel, CH. Finally, WPI had a project center in Zurich for a number of years.

**What might we do?**

**Short Term Recommendations**

Develop a Joint Women Leadership Program with Zurich University of Applied Sciences and University of Massachusetts Medical School.

Establish a Summer Scholar in Residence Program

Develop IQP Opportunities involving students from WPI and Zurich University of Applied Sciences

Summer workshop on Chemistry Entrepreneurship

**Long Term Recommendations**

Student exchange program
Campus as a hub (prepared by Drs. Tom Thomsen and Rick Vaz)

Introduction

In the NAFSA, Association of International Educators report titled “Comprehensive Internationalization from Concept to Action”; the author John K. Hudzik makes the following observation “The importance and role of creating an organizational culture that sustains Comprehensive Internationalization is critical. Two essential components of such a culture are (1) an institutional ethos that manifestly connects local, national and global dimensions of institutional missions and values, and (2) guidance and accountability provided by goals and intended outcomes.”

One goal for globalization at WPI could be to assure that every undergraduate student is given significant exposure to international comparative and global content as part of their WPI educational experience and that all graduate students are provided with the framework to give them an understanding of the practice of their profession and discipline in other cultures.

In order to create a WPI culture that embraces and supports globalization to achieve the goal of ensuring that all students leave WPI with a certain level of global competency, the initiatives listed below are suggested as a starting point for discussion.

Curricular Initiatives

- Hire faculty to build new area studies and language offerings in the Humanities and Arts, especially aligned with areas of the world where WPI has Project Centers.
- Provide support for course re-development to focus on international issues, especially in disciplines such as engineering and science where such linkages are less often found.
- Consider a global graduation requirement that could be met either by an off-campus experience or global-related coursework on campus.
- Develop additional Great Problems Seminars with explicitly global themes.

Co-curricular Initiatives

- Develop programs to leverage students’ international experiences after they return to WPI.
- Make information and access to international career and graduate school opportunities more available to WPI students.
- Develop international internship opportunities.
• Increase support to International Student Council and the Office of International Students and Scholars to encourage more outreach and engagement across campus.
• Make global awareness and engagement an explicit theme of New Student Orientation.
• Encourage and support the student programming committee SocCom to include more global and cultural programs

**Faculty Initiatives**

• Support faculty development of global MQPs in disciplines where student interest exceeds current opportunities.
• Provide funding to support visiting faculty from other countries.
• Expand WPI’s capacity to provide housing for visiting faculty.

**Further Globalizing the Campus**

• Fund scholarships for Global Perspective Program participation to make off-campus project experiences possible for all qualified WPI students.