

## **AC 2007-1177: IFEES: A NEW ALLIANCE TO SHAPE GLOBAL ENGINEERING EDUCATION FOR THE 21ST CENTURY WORLD**

### **Hans Hoyer, American Society for Engineering Education**

Hans J. Hoyer is director for International Programs & Strategy for ASEE and the newly created IFEES. He is trained as a social scientist and he taught cultural anthropology at George Mason University and also was a visiting scholar and fellow at Harvard and MIT. He was dean at the School for International Training in Vermont. He has led several international development organizations through out Latin America, Africa, South Asia and Europe. Hans has written on a variety of international development topics. Prior to coming to ASEE he was CEO of World Links, a spin off of the World Bank.

## **IFEES: A New Alliance to Shape Global Engineering Education for the 21<sup>st</sup> Century World**

We are all now part of a worldwide market economy involving billions of people. However, due to advances in inexpensive, powerful and omnipresent information technology, we communicate with the rest of the world in ways undreamed of a generation ago.

Since most of the technology we use is developed by engineers, the field of engineering is being drastically altered by these changes. Recognizing that the 21<sup>st</sup> century global economy requires well-trained and culturally-sensitive engineers who have a broad vision related to the domestic and international issues facing all of us globally, representatives of 31 organizations from six continents gathered in Rio de Janeiro, Brazil, October 9, 2006 to launch the International Federation of Engineering Education Societies (IFEES). This meeting was seen as the culmination of discussions that had been underway since the ASEE Global Colloquium in Sydney, Australia in 2005 and that involved leaders in engineering education who recognized that a global network of engineering education societies was needed.

In addition to electing in Rio de Janeiro a distinguished leadership team representing all the regions of the world and approving governing documents, the organization's members discussed their overarching goal of building a vibrant, virtual global community to foster collaboration and learning among the world's engineering-education societies and to building strong bridges to the corporate world, civil society and academia.

Through the collaboration of its member societies and their partnership with industry, university, government and non-governmental organizations, IFEES will work to establish effective engineering education processes of high quality around the world to assure a global supply of well-prepared engineering graduates. IFEES will strengthen member organizations and their capacity to support faculty and students. It will attract corporate participation, helping to connect engineering graduates with international corporations that have a pressing need for well-trained engineers who can work in a global environment. IFEES will also enhance the ability of engineering faculty, students and practitioners to understand the varied cultures of the world and work effectively in them.

The elected leadership team includes **Professor Claudio Borri, IFEES' first elected president**. A highly respected university professor at the University of Florence, Italy, Dr. Borri is also president of the European Society for Engineering Education (SEFI). There are eleven members on the executive board including vice presidents representing four geographic regions of the globe: Americas, Africa/Middle East, Europe, and Asia/Pacific. Mervyn Jones, Qing Lei, James Melsa, Lueny Morell, and Nitte Shetty were elected as executive board members for the next two years. Kwang Sun Kim, Norbert Kraker, Maria Larrondo-Petrie, Siphon Madonsela, Yuri Pokholkov, and Javier Paez Saavedra were elected as executive board members for the next year.

IFEES' overarching mission is fostering collaboration and learning among the world's engineering education societies. This will require participating organizations to share with one another not only the sorts of issues and problems they face, but also to appraise possible solutions. The creation of a global marketplace of "best practices"----under the

auspices of IFEES----will enable members not only jointly to address engineering-education challenges worldwide, but to strengthen their organizations and their capacity to support faculty and students. This cross-fertilization of ideas should be particularly useful to emerging engineering-education societies, and their equivalent organizations, in providing productive value-added services to their individual members. Indeed, IFEES is expected to become a virtual global community where people, courses and data are shared, as well as ideas. It must become a community that enhances the capacity of engineering faculty, students, and practitioners to understand the varied cultures of the world and work effectively in them. It must become a community of societies, faculty, students and companies with a shared goal of promoting the globalization of engineering, with all its promise for both the developed and so-called developing world. Finally, it must become a community that brings together talented individuals from the world's emerging societies and universities as well as the international corporations that have a pressing need for well-trained engineers who can work in a global environment. In short, IFEES must be a "flat-world facilitator."

As of January 2007, the organization is still very much in its formation. Following the recent Rio inauguration, the Executive Committee, led by Claudio Borri's, has just begun the process of articulating strategic directions. IFEES will hold its first, stand-alone annual meeting/forum on September 30, 2007 in Istanbul, Turkey, just prior to the ASEE Global Colloquium for Engineering Education. A planning committee has been formed and a delegation of its members will be meeting with ASEE staff on January 11/12, 2007 in Washington, DC to continue to define IFEES' direction. The four vice presidents have been asked to take the lead in conceptualizing four key strategic directions for the organization. This task will hopefully be completed in January, in time for the next meeting of the Executive Committee.

It is important to share the vision that Claudio Borri holds for IFEES. Claudio sees that IFEES' role is to "change the world and that science, technology and engineering can make powerful contributions to build overall prosperity for all and contribute to the survival of all mankind. IFEES needs to make a powerful social contribution." He further expressed his vision in terms of asking the fundamental question, "how does IFEES build real value?" He is concerned that "too often engineering is not seen as a profession that contributes positively to society" and that "IFEES must work positively to build a clear and new image of engineering." While Claudio is deeply committed to strengthening the issues related to quality, accreditation, curriculum development and other key issues in the profession, his broader vision is for "IFEES to make a real global impact that addresses the socio-economic issues faced locally and globally." The key question for him that is posed by the 21<sup>st</sup> century global economy to engineering educators and stake-holders is: "How can education in science and technology help to reduce poverty, boost socio-economic development, and take the right decisions for sustainable and environmental compatible development?"

According to Claudio, the creation of a global network of engineering educators and stake-holders will help address formidable basic questions, like the one above, and move beyond them as we raise the horizon and target of our ambitions: i.e. to pass from the day-by-day engineering education issues and problems to the "actual impact" on world-wide development and socio-economic growth. He further states that "IFEES was borne to change the world to the extent which its mission and competencies provide, i.e. as much as engineering education can contribute to these changes. I personally do not believe this to be a too ambitious a target: it is the only true reason why IFEES' birth makes sense!" It is important to build a network of high influential connections with "top personalities" around the world representing not only the engineering world but all sectors of society from economy to social sciences, from political sciences to peace

keeping, from banking to financial investors. And a key method of accomplishing these goals is to always involve students and their organizations in the IFEEES strategy definition and events. The archaic vision of students as ‘customers’ or even ‘end products’ of engineering education must be overturned. We need students on our side, as their visions will also be attracting attention and support from the corporate world.”

To begin, we propose a number of potential activities, and have divided them into three categories related to the amount of resources they would require. The first category proposes activities that IFEEES can implement with limited additional resources. The second category’s proposed activities would require additional moderate financial resources. Substantial extra resources----financial and human, will be needed to undertake the proposed activities in category three. Additional financial resources, other than those provided by member societies, will have to be raised from corporations, multi- and bi-lateral and regional organizations and foundations. We will also be looking for volunteers from academia, government agencies, civil society organizations and the corporate world to help with these efforts. Sub-committees, comprising of members of engineering societies, universities, corporations and civil society organizations are in process of being formed to work on implementing these activities.

### **CATEGORY I**

- **Creation of an international engineering education website.** We envision a site that includes a message board for discussing issues in engineering education, and links to international engineering programs. A portion of the site will be dedicated to supporting initiatives of engineering students and young engineering professionals from throughout the world, where they can raise and discuss issues of mutual interest. ASEE will develop and maintain the website and has begun to work with a member of the Executive Committee to accomplish this task. Given IFEEES’ strategic interest to facilitate a global student movement thereby building on the successful Global Student Forum first held at the ASEE Global Colloquium in Rio de Janeiro in October 2006, several students have begun the task to develop a student website and link it to the emerging IFEEES website.
- **Coordination and maintenance of a conferences and meetings calendar.** This on-line tool would post information about scheduled or planned engineering-education conferences around the world to reduce date conflicts and duplication. Efforts will be mad to merge conferences where appropriate to increase their overall effectiveness and quality.
- **Development of a high-quality international engineering-education newsletter.** This publication, created with the assistance from member organizations, will include content from participating societies, as well as from other global sources.
- **Development of an annual publication profiling engineering colleges from around the world.** Like the successful ASEE U.S.-Canada publication “Profiles of Engineering and Engineering Technology Colleges,” this publication would gather data and publish basic profiles of engineering schools worldwide. It would include such information as engineering degrees offered, faculty members, enrollments and graduation rates.

## CATEGORY II

- **Institution of international forums** to promote the globalization of engineering education. These forums would require the collaboration of engineering-education societies, universities, corporations, multi-and bi-lateral organizations and civil society groups. Not only are these forums expected to critically examine cutting-edge issues, they would advance the development of strong academic, corporate and government relationships.
- Consistent with the above formulation, IFEEES will hold its **first full day forum on September 2007** just prior to the Global Colloquium in Istanbul. A planning committee has begun to define the objectives, expected outcomes and is in the process of identifying key global leaders as guest speakers. The central idea is for this IFEEES forum to stand on its own and not compete but complement the ASEE GCEE and other international Engineering Education activities. There is close interaction between the IFEEES planning committee and the GC program committee.
- **Development of an Engineering for the World Initiative (EWD) network.** This is expected to be a live and virtual network of engineering students worldwide who are already exchanging ideas and learn how engineers are educated in other countries and what it means to be a global engineer. The first Student Forum in Rio de Janeiro, where over 50 students met, represented an excellent opportunity for students from Latin America, North America, Europe, Africa and India to interact with one another, engineering and corporate professionals, government officials as well as representative from multi-lateral organizations such as the World Bank, Inter American Development Bank and the Organization of American States. Several students who participated in the Rio meeting are currently working with ASEE staff and volunteers as well as the IFEEES president to plan the forthcoming Student Forum in Istanbul. One of the events that are currently being planned is a workshop offered by the World Bank for youth focusing on innovation, entrepreneurship and the knowledge economy.
- Discussions are under way leading toward the creation of a **Global Engineering Deans Council** that would build on the highly successful ASEE sponsored Deans Council and Engineering Deans Institute.
- Creation of a **virtual engineering-education magazine** that focuses on issues raised by globalization. This would be an advertising-supported magazine, initially published once a year.

## CATEGORY III

- **Institution of a global outreach campaign.** This would provide opportunities for engineering faculty, students and professionals from developed nations to provide technical assistance, curriculum support and other feedback to universities, institutions and communities of developing nations. Assistance would come from international non-governmental organizations, national socio-economic development organizations, corporations, foundations and multi-and bi-lateral organizations.
- Establishment of mechanisms that enable collaboration among the worlds' engineering societies and also strengthen their abilities to respond to the needs of their constituents.
- Broker the development of multi-national design and research activities
- Development of continuing education activities, including virtual courses and workshops, using the most up-to-date software.

**A note to the reviewers:**

As you can see from my paper, IFEES is still very much in formation. As a matter of fact, just shortly after the paper submission deadline, I am meeting with key leaders of IFEES to discuss its strategic directions and am therefore not able to incorporate this additional work into this paper. We have a series of conference calls as well as a forthcoming Executive Committee coming up and those discussions will certainly continue to provide greater clarity and detail on various issues. I am happy to meet your final March 7 deadline and incorporate “the state of the art” at that time which I hope will satisfy your requirements. I look forward to your comments and feedback in order to strengthen the paper for the Hawaii meeting.