Session T2B


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Abstract: Leading educators who have made risky career commitments to international engineering education have often experienced challenges beyond the boundaries of home countries that made them critical analysts of their work and identities. This panel introduces the unique research process that helped sixteen educators make visible how their goals and motivations extend far beyond the commonly invoked image of global competence as a new skill. Short presentations follow from five contributors to the recently-published What Is Global Engineering Education For?: The Making of International Educators.

Their accounts of struggles and successes highlight the difficulties in moving international and global engineering education from the margins to the core of engineering curricula. Subsequent open discussion invites commentary from all present about strategies for maximizing the extent to which students gain access to international and global engineering education and genuinely confront and rethink assumptions and career trajectories born in home countries.

Panel Overview

The panel will help current and potential international engineering educators and administrators understand (a) the transformational moments that led pioneering educators to commit their lives and careers to international engineering education, (b) the full range of motivations for international and global engineering education (including but extending beyond economic competitiveness), and (c) the objectives and practices of existing educators. It will also facilitate ongoing efforts to identify the forms of knowledge engineering students gain through international experiences and to discuss strategies for assessing that knowledge. Finally, it will alert attendees to the range of different program types currently used in the U.S.

The session begins with a description of the research process that led to the production of “personal geographies” mapping the career trajectories of participants. The process included a unique workshop hosted by the Center for the Advancement of Scholarship on Engineering Education (CASEE) at the National Academy of Engineering. Both prior to and during the workshop, participants critically analyzed one another’s draft 10,000-word manuscripts. The key feature of the workshop was that authors were prohibited from participating in discussions of their own manuscripts. This methodological strategy transformed the experience into a collective writing process with effectively shared authorship. The strategy is transferable to other types of projects.

Five panelists then offer 5-7 minute summaries of their personal geographies. These highlight the transformational moments—usually experiences of profound incongruence—that contributed to subsequent risky career commitments. Their discussions illustrate how their goals extend far beyond the commonly invoked image of global competence as a new skill. The final 35-40 minutes focuses on what is at stake in scaling up international and global engineering education.

Key discussion topics include (a) prospects for both maintaining and expanding international education within engineering education, (b) the use of “personal geographies” to make visible engineering students’ and educators’ experiences that are otherwise hidden, (c) how to make more visible evidence of personal and professional transformation, (d) needed learning resources for international and global engineering education, and (e) funding strategies and opportunities available for international engineering education initiatives.

In their 2009 book The Brokered World: Go-Betweens and Global Intelligence, 1770-1820 (Science History Publications), historians Simon Schaffer et al. point out that the “go-between” is “not just a passer-by or a simple agent of cross-cultural diffusion, but someone who articulates relationships between disparate worlds or cultures by being able to translate between them” (p. xiv). The contributors to this book have made themselves go-betweens between practices of engineering education and work in the United States and elsewhere. How can the knowledge they have gained for themselves and impart to their students be made integral to the preparation of future engineers?

Panelists and Position Statements

Panelists are 5 contributors to a new edited volume, What Is Global Engineering Education For?: The Making of International Educators, published in 2011 by Morgan & Claypool publishers (the first book in their new Global Engineering series, edited by Gary Downey with assistance from Kacey Beddoes). They are leading international engineering educators who have been instrumental in developing educational programs, including study abroad, international service learning, and the Peace Corps Master’s International program.

978-1-61284-469-5/11/$26.00 ©2011 IEEE

October 12 - 15, 2011, Rapid City, SD

41st ASEE/IEEE Frontiers in Education Conference

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Four panelists are engineers, and one is a non-engineer. The engineers describe how gaining new international knowledge challenged assumptions that engineering work and life are limited to purely technical practices, compelling explicit attention to broader value commitments. The non-engineer describes how gaining new international knowledge fueled ambitions to help engineering students better recognize and critically examine the broader value commitments in their work. Two panelists are currently expanding their book chapters into short books to be used in undergraduate classes and preparatory experiences.

James Mihelcic (jm41@eng.usf.edu) is Professor of Civil and Environmental Engineering and Director of the Peace Corps Master’s International Program in Civil and Environmental Engineering at the University of South Florida. He contends that providing international opportunities to graduate students is simply the right thing to do. However it is not simple; it requires changing daily practices of being a faculty member, changing research focus, and finding new ways to publish and make that work valued.

Margaret Pinnell (margaret.pinnell@notes.udayton.edu) is Associate Professor in the Department of Mechanical and Aerospace Engineering and Associate Director of Engineers in Humanitarian Opportunities of Service Learning (ETHOS) at the University of Dayton. She holds that international service learning (ISL) helps students expand the practices of engineering and broaden engineering identities in ways that today’s engineering students expect from their education. Yet, she contends, ISL must be founded on sound pedagogical practices and knowledge and must work to avoid potential exploitation of the communities involved.

Lester Gerhardt (gerhal@rpi.edu) is Professor in Electrical, Computer, and Systems Engineering and Director of International Programs in the School of Engineering at Rensselaer Polytechnic Institute. He maintains that science and engineering should be “regarded as more than a national resource” and that the goal of global education is to produce engineers who understand interconnectedness, cooperation, and awareness of their privileges and service responsibilities. He argues that international education should be required for all engineering students.

Joseph Mook (joemook2005@yahoo.com) is currently Program Manager in the Office of International Science and Engineering (OISE) at NSF and Professor of Mechanical and Aerospace Engineering at SUNY Buffalo. He discovered that the value of time abroad lies not only in technical collaboration but more so in the “real, life-changing, inner transformation” that students experience. He contends that pure immersion in academic exchange rather than traditional study abroad is best for engineering students and that those intense immersion experiences should be as meaningful and specific as possible to individual students’ programs of study. Based on his experiences, he also argues that programs can be self-supporting and financially viable.

Phil McKnight (phil.mcknight@modlangs.gatech.edu) is Chair of the School of Modern Languages and Professor of German at Georgia Institute of Technology. He is committed to the view that foreign languages for engineering students can help produce an “intelligentsia that will understand how to employ technology, science, and the humanities in ways that have a principled, positive impact on society and the world in which we live.” He insists that language learning must encompass “not only culture and literature but science, business, technology, politics, and international relations as well.” Time abroad, he argues, produces engineers with “ethical standards and a great appreciation for developing mutually beneficial business collaboration that would improve the ability of US engineers to become mediators between cultural and workplace differences in solving engineering problems, as well as social problems that may be interconnected.”