Invited Panel – Engineering and Computer Science Education in the Era of Globalization

Ted E. Batchman 1 (Moderator), Alice M. Agogino 2, Frank Bullen 3, Leah H. Jamieson 4, Wayne C. Johnson 5, and Arthur B. Western 6

Abstract - A panel of Engineering Deans and industry representatives examines the challenges of Engineering and Computer Science education in the era of globalization. Engineering and Computer Science education faces significant challenges, such as rapidly evolving technologies, globalization, changing student demographics, and problems associated with funding higher education. Moreover, the rapidly emerging global economy is profoundly affecting the employment patterns and the professional life of graduates. Articles in recent issues of the ASEE Prism, education literature and recent reports form the National Academy of Engineering suggest that current educational practices and policies are not sufficient for dealing with these changes. Successfully addressing these issues will require innovative solutions, including use of new pedagogies and technologies that improve student learning; partnerships among universities, industry, government, and K-12 educators; curriculum reform; and distance learning. The panel members will describe the key challenges facing the education community and the skills our graduates need to remain competitive.

Biographies

Ted E. Batchman (Moderator), Dean, College of Engineering, University of Nevada, Reno

Ted Batchman received his B.S.E.E., M.S.E.E. and Ph.D. degrees from the University of Kansas in 1962, 1963 and 1966, respectively. After completing his Ph.D., he joined LTV Missiles and Space Division as a Scientific Engineering Senior Specialist working on space defense systems. In 1970 he joined the University of Queensland in Brisbane, Australia, as a Senior Lecturer. His research and teaching were in the area of fiber optics and integrated optical devices. He joined the University of Virginia in 1975 and continued his teaching and research in fiber optics and integrated optics with sponsorship from NASA and other government agencies. He also developed and patented a miniature electromagnetic field measurement probe for biomedical measurements. In 1988, he joined the University of Oklahoma as Director of the School of Electrical Engineering and Computer Science. He developed a new computer science school and new programs in electrical engineering including an extensive program in electric vehicle research before joining UNR. In July 1995, he joined UNR as Dean of the College of Engineering. He is a Fellow of the IEEE, is a past member of the IEEE Education Activities Board (EAB) and chair of the EAB Pre-college Education Committee, a member of the IEEE Education Society AdCom since 1993 and editor-in-chief of the IEEE Transactions on Education from January, 1997 to January 2001 and is currently on the FIE Steering Committee.

Alice M. Agogino, Roscoe and Elizabeth Hughes Professor of Mechanical Engineering, University of California, Berkeley

Alice M. Agogino is the Roscoe and Elizabeth Hughes Professor of Mechanical Engineering and affiliated faculty at the Haas School of Business in their Operations and Information Technology Management Group. She directs the Berkeley Expert Systems Technology (BEST) Laboratory, the Berkeley Instructional Technology Studio (BITS) and is working with Dean Newton to develop a Service Learning Meida Lab and Design/Prototyping Studio in the new CITRIS building. She is currently Vice Chair of the Berkeley Division of the Academic Senate and will serve as Chair during the 2005-2006 academic year. She has served in a number of other administrative positions at UC Berkeley including Associate Dean of Engineering and Faculty Assistant to the Executive Vice Chancellor and Provost in Educational Development and Technology. She also served as Director for Synthesis, an NSF-sponsored coalition of eight universities with the goal of reforming undergraduate engineering education, and continues as PI for the NEEDS (www.needs.org) and the (www.smte.org) digital libraries of courseware in science, mathematics, engineering and technology.

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2 Alice M. Agogino, Roscoe and Elizabeth Hughes Professor of Mechanical Engineering, University of California, Berkeley
3 Frank Bullen, Head of the School of Engineering, University of Tasmania, Australia
4 Leah H. Jamieson, Associate Dean for Undergraduate Education, Purdue College of Engineering, Ransburg Professor of Electrical and Computer Engineering and Director, EPICS: Engineering Projects in Community Service
5 Wayne C. Johnson, Vice President, University Relations Worldwide, Hewlett-Packard Company
6 Arthur B. Western, Vice President for Academic Affairs and Dean of the Faculty, Professor of Physics and Optical Engineering

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Dr. Agogino is a registered Professional Mechanical Engineer in California and is engaged in a number of collaborative projects with industry. Prior to joining the faculty at UC Berkeley, she worked in industry for Dow Chemical, General Electric and SRI International.

Dr. Agogino received a B.S. in Mechanical Engineering from the University of New Mexico (1975), M.S. degree in Mechanical Engineering (1978) from the University of California at Berkeley and Ph.D. from the Department of Engineering-Economic Systems at Stanford University (1984).

Leah H. Jamieson, Associate Dean for Undergraduate Education, Purdue College of Engineering, Ransburg Professor of Electrical and Computer Engineering and Director, EPICS: Engineering Projects in Community Service

Leah Jamieson is Associate Dean of Engineering for Undergraduate Education and Ransburg Professor of Electrical and Computer Engineering. She is co-founder and Director of the Engineering Projects in Community Service (EPICS) Program.

Prof. Jamieson has been recognized for her achievements in research, service, and teaching. She was elected a Fellow of the IEEE for her research on parallel processing algorithms and has received the IEEE Signal Processing Society's Meritorious Service Award. She is a 2001 NSF Distinguished Teaching Scholar, was named 2002 Indiana Professor of the Year by the Carnegie Foundation, and was recently elected to the U.S. National Academy of Engineering “for innovations in integrating engineering education and community service.” In 2005, Jamieson and colleagues Edward Coyle and William Oakes were awarded the NAE’s Bernard M. Gordon Prize for Innovation in Engineering and Technology Education. Prof. Jamieson is leading Purdue's engineering curriculum reform initiative, “Purdue's Future Engineer.”

Prof. Jamieson has an S.B. in Mathematics from M.I.T. and a Ph.D. in Electrical Engineering and Computer Science from Princeton University. She joined the faculty at Purdue in 1976.

Frank Bullen, Head of the School of Engineering, University of Tasmania, Australia

Frank Bullen has over 25 years experience in teaching engineering, has lectured and researched in 3 universities, 5 countries and has an extensive international and national publication record. His enthusiasm for teaching is centred on problem based learning and encouraging staff to be innovative and daring in their teaching. His School has approximately 35% non-domestic students enrolled and globalization of engineering and internationalization of the curriculum lies close to his heart. He is also currently President of the Tasmanian Division of Engineers Australia and thus has a vested interest in the academia-industry nexus.

Wayne C. Johnson, Vice President, University Relations Worldwide, Hewlett-Packard Company

Wayne C. Johnson is the Vice President for Hewlett-Packard Company’s University Relations department worldwide, located at HP Laboratories in Palo Alto, California. He is responsible for higher education programs in research, marketing and sales, recruitment, continuing education, public affairs and philanthropy.

Johnson joined HP in July 2001 from Microsoft’s University Relations department where he managed Program Managers and administrative staff across a customer base of 50 tier-one universities. From 1967 to 2000, he held a variety of positions at the Raytheon Company in Lexington, Massachusetts, including National Sales Manager for Wireless Solutions, Manager of International Financing and Business Development, Manager of Administration and Strategic Planning for Raytheon's Research Division, and Manager of Program Development and Operations for Technical Services.

Johnson received his B.A. in 1967 from Colgate University, Hamilton, NY and his M.B.A. in 1971 from Boston College’s Carroll School, Boston, MA. He was an Adjunct Professor of Management at Boston University from 1977 to 1999.

Johnson currently manages an organization of 23 Program Managers and administrative staff working across 74 universities worldwide.

Johnson serves as a board member of the Anita Borg Institute for Women and Technology (ABIWIT), MentorNet (MN), NASA’s Educational Advisory Committee, Corporate Foundation Alliance (CFA), Accreditation Board for Engineering and Technology (ABET) Industrial Advisory Board, the International Conference on Engineering Education (ICEE), and a member of the Glion Colloquium. He was recently appointed to the board of Alliance for Science and Technology Research for America (ASTRA), and is a member of GUIRR (Government-University-Industrial, Research Roundtable).

Arthur B. Western, Vice President for Academic Affairs and Dean of the Faculty, Professor of Physics and Optical Engineering

Art Western is Professor of Physics & Optical Engineering and Vice President for Academic Affairs & Dean of the Faculty at Rose-Hulman Institute of Technology. Over the past several years he has been involved in a variety of projects to promote undergraduate technological entrepreneurship and collaborative projects with industry. Western received the B.S. degree from Rollins College, Winter Park, Florida and the Ph.D. in physics from Montana State University.