AC 2007-1308: ARTICULATING A MULTIFACETED APPROACH FOR PROMOTING DIVERSITY IN GRADUATE ENGINEERING EDUCATION

Eugene DeLoatch, Morgan State University
Eugene Deloatch is Dean of Morgan State College of Engineering. He served as the President of ASEE in 2002-2003.

Sherra Kerns, Franklin W. Olin College of Engineering
Sherra Kerns is Vice President for Innovation and Research at the Franklin W. Olin College of Engineering. She served as the President of ASEE in 2005-2006.

Lueny Morell, Hewlett-Packard
Lueny Morell is Director of Hewlett Packard Latin America University Relations Program and former Professor of Chemical Engineering, University of Puerto Rico at Mayaguez.

Carla Purdy, University of Cincinnati
Carla C. Purdy is an Associate Professor in the Department of Electrical and Computer Engineering at the University of Cincinnati.

Paige Smith, University of Maryland
Paige Smith is Director of the Women in Engineering Program, James A. Clark School of Engineering, University of Maryland.

Samuel Truesdale, Rolls-Royce Corporation
Samuel L. Truesdale is Manager of Employee Development, Strategic Engineering, Business Improvement and the Chair of the Engineering Education Council at the Rolls-Royce Corporation.

Barbara Waugh, Hewlett-Packard Company
Barbara Waugh, author of "The Soul in the Computer: the Story of a Corporate Revolutionary", develops and directs programs in strategy and change for Hewlett Packard.

Articulating a Multifaceted Approach for Promoting Diversity in Graduate Engineering Education

Abstract

This presentation is a continuation of a multiyear discussion focusing on encouraging diversity in engineering education, with an emphasis on graduate education. It will provide both a summary of previous years' discussions and an introduction to this year's discussion, in a session jointly sponsored by three ASEE divisions--the Graduate Division, Minorities in Engineering, and Women in Engineering. In previous years we have looked at successful programs and initiatives at a number of institutions, identified important issues for promoting diversity at the graduate level, and elucidated a strategy for promoting diversity, based on a holistic model which can also be applied in industry. Our focus now is on tactics which can be employed to support this strategy, whether by diversity program coordinators, other college and university administrators, groups of faculty and students, external stakeholders such as potential employers, or individuals.

Introduction

This presentation continues a discussion begun in 2004 on the specific problems of increasing diversity in graduate education. [1,2,3]. These discussions focused on:

- showcasing exemplary programs for graduate students and for encouraging undergraduates to choose graduate study (at Arizona State University, University of Puerto Rico-Mayaguez, University of Washington, Mercer University, and University of South Florida)
- defining underlying issues affecting diversity at the graduate level
- articulating a holistic approach for dealing with the issues identified.

In this year's discussion we will address ways to achieve a multilayered approach to encouraging diversity, with modifications for environments which can provide different levels of support.

Encouraging diversity--decreasing commitment at the graduate level

While there are many excellent college and university programs which provide support and encouragement for women and minorities in engineering, most of these programs emphasize undergraduate education. And many institutions, especially in this era of tight budgets, are scaling back the initiatives they have put in place. In addition, by their structure, with more emphasis on specific research groups or departments, graduate programs are less likely to be influenced by institutional diversity programs which are in place. Thus it is quite likely that a woman or minority student who does enter a graduate degree program will be moving from an environment with a strong support system into a more traditional environment. The number of role models and potential mentors may be much smaller than at the undergraduate institution, and much mentoring may need to take place at a distance. Students may have participated in special research programs for undergraduates, with components providing mentoring and encouragement to continue on to graduate education. But the research climate for a typical graduate student may be very different from the supportive atmosphere provided by these undergraduate research programs. Thus it is important to look at tactics which students moving into more traditional graduate programs, and their mentors, can use to help them succeed.

Therefore a prevailing theme of this panel discussion will be to identify particular problems associated with this transition and tactics to overcome them.

Discussion topics

Particular questions to be addressed in this discussion include:

- What information do students need to successfully move from a supportive environment into one which is structured more traditionally? Are there skills / abilities / information which are not being transmitted? (We don't want to change completely to fit into a new environment but more knowledge will make the transition easier).
- What communication skills would assist a student with making the transition to a more traditional environment?
- What are the unspoken barriers which must be overcome? How can they be overcome in institutions where there is not a thriving community of peers?
- Can we use distributed mentoring? Could there be online training for students entering more traditional graduate programs? If so, what group could best provide this training?
- How do we affect the graduate admission process?
- Should we be recruiting students into programs where there isn't community support?
- What can we do when we see situations that are counterproductive to encouraging / retaining students who are members of underrepresented populations?
- Who is really the right person in the student's environment to deal with diversity issues? If this person is not sufficiently aware of the issues, what do you do?
- How can we broadly disseminate information and tactics resulting from our discussions?
- How can new research on encouraging diversity in engineering education be better applied to the specific case of graduate education?
- Often, women and minority students enter a graduate program with support from targeted funds, not linked to a particular professor's research. This provides freedom and flexibility, but may also decrease opportunities for mentoring and contacts with other graduate students. How can a student in this situation quickly become part of the "graduate student bullpen"?
- How can we use engineering problem-solving skills to mitigate the frictions in our diverse society and to enhance the participation, value, and acceptance of the skills and ideas of everyone? Is this a problem we can engineer a solution to? If so, can we define a process model and an iterative design methodology?
- How can we be viewed as "just another student / faculty member"--do we want to be?
- How do we move beyond diversity programs to broad acceptance of competence but still provide a community of support?
- How do we have productive conversations without making everyone self-conscious?

Building a virtual community to support diversity

The above questions are based on an underlying assumption that, at a particular institution, there will be a recognized group of "diversity champions" to mentor graduate students, recruit undergraduates into graduate programs, and encourage institutional changes which promote diversity. This is certainly the case at many institutions, including those whose representatives have presented papers in this ongoing session over the past few years. But there still exist many

universities at which this is not the case. At these institutions, there may be some institutionalized programs and periodically there may be programs funded through external grants. However, many of the efforts to promote diversity, especially at the graduate level, will be led by individual faculty and staff or by groups of volunteers. In such institutions, there may even be competing efforts, due to lack of an overall institutional strategy and of adequate methods for sharing information among programs, even on the same campus. So, in addition to the many specific questions listed above, a fundamental issue that must be addressed is how to empower this distributed community of diversity champions. In particular, faculty are in need of strategies to help them be effective supporters of diversity while carrying out their research and teaching duties and to help them avoid burnout. Thus an important goal of this ongoing discussion is to find ways to build a virtual community whose members can work together throughout the year to share best practices and to support one another's efforts.

Bibliography

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