

2006-2451: HOW TO PREVENT MARGINALIZATION OF UNDERREPRESENTED STUDENT POPULATION MEMBERS ON ENGINEERING STUDENT TEAMS

Paige Smith, University of Maryland-College Park

PAIGE E. SMITH, Ph.D., Director of the Women in Engineering Program, A. James Clark School of Engineering, University of Maryland. Dr. Smith has received several grants in the area of team behavior and improving team environments for members of underrepresented student populations in engineering. She provides leadership in recruiting and retaining female engineering students for the college. Her current research focuses on engineering design teams and project management.

Linda Schmidt, University of Maryland-College Park

Patricia Mead, Norfolk State University

Stephanie Adams, University of Nebraska-Lincoln

How to Prevent Marginalization of Underrepresented Student Population Members on Engineering Student Teams

Abstract

The best engineering project teams encourage members to attempt tasks outside their academic comfort zone and support members to succeed. Faculty members must be able to identify problematic team interactions and mitigate their impact. This is especially critical when teams include members of underrepresented student populations in engineering. These groups include women, African Americans, Latinos/Latinas, and Native Americans. Members of these groups may already be challenged by lack of similar others among peers and faculty. This Workshop will present a panel of engineering faculty and program specialists who will present best practices on preventing marginalization. The workshop is intended to be an interactive experience with a lively and engaged group of attendees.

The Workshop

Engineering student project teams can be collaborative, interdependent, and supportive learning networks that inspire participants to perform at a level equal to or above their prior individual bests. Ideally, engineering project teams encourage members to attempt tasks outside their academic comfort zone and support students as they learn new concepts and skills. Sadly it has been observed that students who participated in contentious teams often failed to learn the engineering material due to their desire to disengage from the tension filled environment. Dominating team members who marginalize others and “slackers” who expect everyone else to work hard while they settle for the “group grade” also negatively impact student satisfaction with the team experience and the field of engineering.

Now that project teams are taking a central role in engineering classes, faculty members must be able to identify problematic team interactions and deal with them. This is especially critical when teams include members of underrepresented student populations in engineering. The underrepresented groups are women, African Americans, Latinos/Latinas, and Native Americans. Members of these groups may already be challenged by lack of similar others among peers and faculty.

This Workshop will consist of a panel of engineering faculty and program specialists who will present best practices on preventing marginalization from their own research and experience. Specific questions the panel will address include:

- “What is the best way to assign members of underrepresented student populations to teams?”
- “How can peer assessments be designed to recognize and value differences in contribution to team progress?”
- “What are the warning signs of team conflict and when should the course instructor take an active role in conflict resolution?”

The workshop is intended to be an interactive experience with a lively and engaged group of attendees. The workshop panelists are Linda C. Schmidt, Paige E. Smith, Patricia Mead, and Stephanie G. Adams. Short descriptions of panelists' backgrounds are provided below.

Workshop Panelists

Paige E. Smith, Ph.D., Director of the Women in Engineering Program, A. James Clark School of Engineering, University of Maryland. Dr. Smith is the Director of the Women in Engineering program at the University of Maryland, College Park. She earned her doctorate in Industrial and Systems Engineering (ISE) with a focus in Management System Engineering from Virginia Tech. She received her M.S. in ISE and B.S. in Engineering Science and Mechanics from Virginia Tech. Dr. Smith is responsible for providing leadership to the college for recruiting and retaining women in the field. She is currently the Secretary for the Women in Engineering Programs & Advocates Network (WEPAN). Dr. Smith has received several grants in the area of team behavior and improving team environments for members of underrepresented student populations in engineering. She provides leadership in recruiting and retaining female engineering students for the college. Her research interests involve socio-technical systems, with an emphasis on project management and teams, and gender diversity.

Linda C. Schmidt, Ph.D. Dr. Schmidt is currently an Associate Professor in the Department of Mechanical Engineering at the University of Maryland. Dr. Schmidt's general research interests and publications are in the areas of mechanical design theory and methodology, mechanism design generation, design generation systems for use during conceptual design, design rationale capture, effective student learning on engineering project design teams, and increasing the retention and success of women in STEM fields. Dr. Schmidt's engineering education research includes work with BESTEAMS, Building Engineering Student Team Effectiveness and Management Systems (1996- Present). BESTEAMS conducts scholarly research to develop curriculum enhancing standardized team skills training modules for delivery by engineering educators. To date, BESTEAMS has trained over 4000 engineering students in 30 different classes at four different institutions.

Patricia F. Mead, Ph.D., Professor of Optical Engineering, Norfolk State University. Patricia F. Mead, Ph.D., joined the faculty of Norfolk State University as Professor of Optical Engineering in April 2004. She previously served as Senior Program Officer in Engineering Education at the National Academy of Engineering (NAE), Washington, DC, where she successfully completed three policy studies, including The Engineer of 2020, a forward looking examination of the engineering profession and its role in society. Dr. Mead has also served as Assistant Professor of Mechanical Engineering at the University of Maryland, College Park where she carried out a successful research program in packaging and reliability of optoelectronic products, and she was actively involved in engineering education reform. In 1997, Dr. Mead received the NSF Faculty Early CAREER Award in recognition of her combined research and educational activities. Dr. Mead is the first African American woman to receive the Ph.D. from the college of engineering at the University of Maryland, and she has been a Faculty Fellow of the Hewlett Packard Company and a Doctoral Fellow of the Eastman Kodak Company (Rochester, NY), She has published numerous archival journal and conference papers on photonics and engineering education research.

Stephanie G. Adams, Ph.D., Assistant Dean for Research and Associate Professor of Industrial and Management Systems Engineering, University of Nebraska Lincoln College of Engineering and Technology. Dr. Adams is presently serving as a Fellow for the American Association for the Advancement of Science and the National Science Foundation. The fellowship program is designed to provide a unique public policy learning experience and to provide insight into the decision-making processes of the foundation. Dr. Adams will spend the next year in Washington, D.C., working in NSF's Directorate for Engineering, Division of Engineering Education and Centers. Adams research has included focused on engineering education. In 2003, she received a \$587,568 career grant from NSF to implement "Designing Effective Teams in the Engineering Classroom for the Enhancement of Learning." Adams is a cum laude mechanical engineering graduate of North Carolina A&T State University and holds a master's degree in systems engineering from University of Virginia and a doctorate in interdisciplinary engineering from Texas A&M University.