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Graduate Studies Division

Invited Panel Session:
Issues Driving Reform of Faculty Reward Systems
Relevant to Professional Graduate Engineering Education

Invited Panel Paper # 3

Issues Driving Reform of Faculty Reward Systems to Advance Professional Graduate Engineering Education: Expectations For Adjunct Industrial Faculty

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Abstract

The third paper in this special graduate studies division panel session focuses on issues driving reform of faculty reward systems to advance professional graduate engineering education. Creative engineering practice and leadership of technological innovation to enhance U.S. competitiveness is mission critical to economic development and growth of jobs within the United States of America. The paper and presentation will address the need for appropriate recognition of adjunct industrial faculty in professional graduate engineering programs. As identified by the Council of Graduate Schools recently, faculty engaged in professional practice are a major attribute for developing and sustaining high-quality professional graduate programs in engineering and technology. Reward systems and professional recognition of these expert faculty must be improved in order to attract high-caliber, experienced, practicing engineers and industrial leaders from industry. Adjunct industrial faculty teaching in engineering and technology professional graduate programs add remarkable leading edge insight to the needs of industry to be more competitive. Because of current emphasis on research-driven graduate education and the university quest for federal funding, our nation's experienced professional engineering talent in industry has been one of the most underutilized U.S. faculty resources. The opportunity for innovative universities to better recruit, develop, and reward this unique resource of U.S. domestic engineering talent must not be ignored. Use of this experienced resource in combination with core university faculty, builds a formidable U.S. strength for engagement with industry to improve professional graduate engineering education for world-class competitiveness as a professional complement to the existing academic research strength.

A Question of Mission: Developing Creative Professional Scholarship and Re-Examining Faculty Rewards

The Collaborative recognizes that one of the major impediments in implementing high quality professionally-oriented graduate education for the U.S. engineering workforce has been an almost singular emphasis of the pursuit of research grants and overhead monies "as the cash cow" (as Burr so prophetically pointed out over thirty years ago) and the lack of vision and mission to provide incentives and reward structure that encourage faculty to pursue educational innovation in professional education and in building solid relationships with industry.

As the ASEE-Green Report has pointed out:

"In whatever way an engineering college defines its mission, to be successful, it must ensure that its faculty reward system supports its goals. Faculty members often face the difficult task of trying to balance the several activities they need for professional advancement * such as research and undergraduate teaching * with a host of new activities their colleagues, students and the public expect them to accomplish. These can include curricula development, interdisciplinary collaboration, work with industry, development of continuing education programs, community outreach, and mentoring of other faculty members and students. As engineering colleges develop institutional missions, they have an opportunity to recraft their faculty reward system to better synchronized faculty rewards with their new, or re-affirmed, institutional expectations.

Changing the faculty reward system will not be an easy task. Faculty rewards are heavily driven by incentives created across the entire university and are part of a nationwide network. Nevertheless, it is important that rewards reflect the goals of the institution and it is important to begin the conversation now. As each institution establishes its vision and charts new directions, it should ensure that its faculty reward system supports the institutional goals."

Thus, a major task of the National Collaborative has been to begin this task and to define a parallel system of faculty reward for teaching, creative professional scholarship in engineering, and professional service that compliments the traditional research-based system for teaching, research, and service in typical universities cultures. Whereas, as the Kellogg Commission has pointed out, universities are being criticized as being too "research-driven" which requires reform to renew their broader covenant, educational commitment and to broaden their missions, little reform will be made unless action is taken to support faculty in these endeavors. Whereas the work of academic research faculty is primarily measured by the amount of research grants and monies attracted, grant proposals written, papers generated in refereed scientific journals, and by teaching, the work of professional-oriented faculty must be measured in other ways because their mission for teaching, professional service, and creative professional scholarly activity in advanced engineering practice and leadership of technology development and policy is quite different from academic scientific research.

Thus, a major task of the National Collaborative will be to begin this task and to define a parallel system of faculty reward for teaching, creative professional scholarship in engineering, and professional service that compliments the traditional research-based system for teaching, research, and service in typical universities cultures. Whereas, as the Kellogg Commission has pointed out, universities are being criticized as being too "research-driven" which requires reform to renew their broader covenant, educational commitment and to broaden their missions, little reform will be made unless action is taken to support faculty in these endeavors. Whereas the work of academic research faculty is primarily measured by the amount of research grants and monies attracted, grant proposals written, papers generated in refereed scientific journals, and by teaching, the work of professional-oriented faculty must be measured in other ways because their mission for teaching, professional service, and creative professional scholarly activity in advanced engineering practice and leadership of technology development and policy is quite different from academic scientific research.

A Question of Finances and Adequate Resources: Developing New Sources of Funding for Professional Faculty. As Conrad and Haworth have pointed out, one of the most important attributes in developing and sustaining high quality graduate programs for working professionals is that of developing adequate financial support and reward structures for the faculty. Today, there appears to be little question that high quality professionally-oriented graduate education relevant to the practice of engineering and leadership of technology development for the nation's engineering workforce fits within the mission of engineering schools. The question, however, is how to fund it.

We cannot expect that research-oriented faculty, who are hired, promoted and tenured on their ability to attract research monies and to build research programs that support research-oriented graduate students, will be rushing to make educational change for professionally-oriented graduate education. At many universities, research is the primary goal and "teaching has become a bothersome chore.

A Question of Research-Driven Money: Developing Creative Professional Scholarship and Re-Examining Faculty Rewards. For making this educational innovation a reality, the National Collaborative recognizes that one of the impediments to creating high quality professionally-oriented graduate education for the engineering workforce across the nation has been an overriding singular emphasis in mission and pursuit of research grants and overhead monies “as the cash cow” at too many universities (as Burr Dean emirtberus of Renselear so prophetically pointed out over thirty years ago), and the lack of vision and mission to provide incentives and reward structure for faculty that encourage sustainable educational innovation in professional education and in building solid on-going relationships with industry.

The ASEE-Green Report pointed out:

“In whatever way an engineering college defines its mission, to be successful, it must ensure that its faculty reward system supports its goals. Faculty members often face the difficult task of trying to balance the several activities they need for professional advancement. For example, research and undergraduate teaching with a host of new activities their colleagues, students and the public expect them to accomplish. These can include curricula development, interdisciplinary collaboration, work with industry, development of continuing education programs, community outreach, and mentoring of other faculty members and students. As engineering colleges develop institutional missions, they have an opportunity to recraft their faculty reward system to better synchronized faculty rewards with their new, or re-affirmed, institutional expectations.

Changing the faculty reward system will not be an easy task. Faculty rewards are heavily driven by incentives created across the entire university and are part of a nationwide network. Nevertheless, it is important that rewards reflect the goals of the institution and it is important to begin the conversation now. As each institution establishes its vision and charts new directions, it should ensure that its faculty reward system supports the institutional goals.”

Thus, a major task in reshaping graduate education will be to begin this task and to define a parallel system of faculty reward for teaching, creative professional scholarship, and professional service that compliments the traditional research-based system for teaching, research, and service in typical universities cultures. Whereas the work of academic research faculty is being measured by the amount of research grants attracted or proposals written, and papers generated in scientific journals, and by teaching, the work of professional oriented faculty must be measured in other ways because their scholarly pursuit and mission in engineering practice and leadership of technology development is quite different from academic scientific research.

Developing new sources of funding for professional faculty is a challenge. As Conrad and Haworth have pointed out, one of the most important attributes in developing and sustaining high quality graduate programs for working professionals is that of developing adequate financial support and reward structures for the faculty. Today, there appears to be little question that high quality professionally-oriented graduate education relevant to the practice of engineering and leadership of technology development for the nation's engineering workforce fits within the mission of engineering schools. The question, however, is how to fund it.

We cannot, nor should we expect research-oriented faculty, who are hired, promoted and tenured on their ability to attract research monies and to build research programs that support research-oriented graduate students, will be rushing to make educational change for professionally-oriented graduate education. At many universities, research is the primary goal and "teaching has become a bothersome chore.

The changing role for a new type of graduate faculty in educating a new type of graduate student population is specifically designed to support educational transformation for career-long learning, growth, professional development, and leadership for creative engineering practice in industry. Non-traditional graduate faculty are at hand and this is an idea whose time is long over due. The transformation neither threatens the research mission nor detracts from the research efforts of research faculty or their institutions, rather it serves to strengthen the professional education mission of universities. New engagement mechanisms of non-traditional graduate education programs provides closer interaction and engagement with industry through the integrative combination of needs-driven directed research. Full-time employees in industry are an untapped lifelong learner who can meet the needs of graduate professional engineer faculty in almost any graduate program. Developing adjuncts as full members of the graduate education faculty will occur through the development and implementation of unique university-industry-government collaborative partnerships. By working together in new engagement mechanisms to strengthen real-world engineering innovation and then bringing it into the graduate classroom, requires existing graduate education faculty, department heads/chairs and deans to take a prominent leadership role in being proactive in the promotion of developing adjuncts as full graduate education faculty. Graduate education schools throughout the

United States can no longer afford not to recognize and promote practicing engineers to appropriate graduate education faculty status. Doing this when other nations are investing heavily in the education of their engineers and technology leaders is mission critical for all engineering and technology graduate education programs.

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