AC 2007-181: ATTRACTING, RETAINING, AND ENGAGING FACULTY ? TRENDS IN ENGINEERING AND TECHNOLOGY

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Attracting, Retaining, and Engaging Faculty: Trends in Engineering and Technology

Abstract

Finding, keeping, and motivating engineering and technology faculty is of paramount concern as U.S. institutions seek to fulfill their teaching, research, and service missions. This paper identifies compensation issues and other faculty opportunities and challenges, drawn from longstanding ASEE-sponsored salary surveys and other national studies on workforce engagement. Issues and trends in engineering and technology faculty roles and rewards are identified; ways to attract, retain, and motivate faculty are addressed; strategies to develop and enhance faculty capabilities are profiled; and the linkages between faculty work and the broader economic development climate and initiatives of the institution and surrounding community are discussed. Implications and considerations for engineering and technology faculty, administrators, policymakers, and other stakeholders are highlighted.

Introduction

According to the *Occupational Outlook Handbook*, engineers (in all disciplines) held approximately 1.5 million jobs in the U.S. 2002 (the most recent year for which employment figures are available), while workers in the broad technology field held approximately 2.6 million jobs (including positions such as engineering technologists, computer systems analysts, database administrators, computer scientists, computer programmers, computer software engineers, and computer and information systems managers).

The need for a prepared, productive, and engaged engineering/technology workforce is well documented.[1,2] Additionally, there is tremendous evidence to suggest that organizations that invest in their human capital – through explicit, employee-centered policies, practices, cultures, and approaches – tend to outperform rival firms.[3,4,5,6] Institutions of higher education face a daunting task in attracting, retaining, and engaging faculty, primarily because of the competition for talent that exists in the broader employment marketplace.

The Context of Faculty Opportunities and Challenges

Any discussion of compensation, reward, and recognition issues in higher education must acknowledge the context in which faculty work continues to evolve. The American postsecondary system – including two- and four-year campuses; public- and private institutions – has been in a state of flux caused by many changes in the internal and external environments and rapid growth for nearly a half century. Most engineering/technology administrators and faculty leaders widely acknowledge that four main factors have been particularly critical in stimulating higher education institutions to rethink how they deliver educational services: *demographic changes*; *increased demands for accountability*; *heightened expectations*; and *greater competition*.

First, demographics are changing. Adult learners over the age of 25 now constitute approximately 40% of postsecondary enrollments, and interest in enrollment, participation patterns and learning objectives has been carefully researched and studied in recent years. At the same time, demographic diversity in postsecondary education, notably among women, African-American, and Hispanic students, has increased, while white men represented less than one quarter (23.1 %) of enrollments in 2000.[7]

Second, there are increased demands for accountability. All postsecondary institutions operate in an environment of increased expectations and demands for accountability from constituent groups, they are also being asked to operate with greater efficiency, doing more with less. Cost effectiveness, then, not only influences students' decisions about which institution to attend, but is also a factor in the evaluation of institutions by legislative bodies and foundations for future funding.[8,9]

Third, there are heightened expectations from all stakeholders. Colleges and universities have long been expected to innovate in the area of teaching and learning, particularly in the emerging area of using technology effectively. Now, there is the ongoing societal expectation that postsecondary institutions should be a catalyst for social change, providing opportunities for those who have been historically bypassed, remedying past inequities, confronting social problems, and preparing the future labor force.[10,11,12]

Finally, all postsecondary institutions operate in an environment of heightened competition for students, faculty, and research funding. It is now commonplace for public institutions to seek gifts and support from the private sector, philanthropists, and alumni, and for private institutions to seek support from states and the federal government. Not only are public and private not for profit institutions competing with one another, but the rapid growth of for-profit, distance learning, and on-line institutions has introduced another competitor for the available students, instructors, and funds.[13,14]

The convergence of these four trends creates both a challenge and an opportunity from which some institutions will emerge stronger and more durable, and others will not. How successfully, and how quickly, these institutions rethink the way they deliver services will be determined by their responses to three topic areas. First, students should be considered learners who participate actively in their own *learning*. This, in turn, implies that teaching practices must be re-conceptualized as *learning processes*. In addition, educational goals must be re-conceptualized to meet the needs of *individual and professional goals*. Each of these changes has impacts how institutions will find, keep, and engage faculty, including those in the engineering/technology disciplines, and will be discussed below in the section on implications and considerations.

Issues and Trends in Engineering and Technology Faculty Recruitment, Roles, and Rewards

In general, engineering/technology faculty are attracted to the institution through advertisements placed in specialized trade publications. Other ways faculty are recruited include employee referrals, college and university placement offices, professional associations and meetings (such as ASEE), job fairs, and postdoctoral internships. Determining the effectiveness

of the recruitment source requires identifying the cost of acquiring talent, past experiences with recruitment sources, and the retention, satisfaction, and performance of faculty recruited through various recruitment channels. Recruitment and reward/recognition are inherently and explicitly linked, as the ability to pay at-, above-, or below-market determines, in part, the type of faculty member recruited and retained by an institution.[15]

For over twenty years, ASEE has sponsored annual engineering technology faculty salary surveys. Administrators, faculty leaders, and other decision-makers must make compensation and reward decisions using criteria that take into consideration both internal consistency and market competitiveness. Internal consistency involves understanding the nature of each job and determining why and how positions are paid similarly or differently. Market competitiveness seeks to determine the institution's ability to pay based on internal considerations (e.g. budget constraints), local labor market pressures (e.g. competition for engineering/technology talent within the city or town), and national professional or occupational standards—for which tools such as the ASEE-sponsored survey provide a broader perspective.

While salary surveys, budgets, and market considerations provide a context for reward/recognition decisions, so, too, does the unique nature of faculty work and the outcomes of such work. Thus, the ability to recognize individual contributions continues to be a priority and challenge for administrators, especially in professions such as engineering/technology where there is considerable external competition for talent. Seniority pay, in which faculty are rewarded based on years of service to a particular institution, has increasingly been eclipsed by the need to link compensation decisions to the meritorious nature of a faculty member's performance in teaching, research, and service.[16]

Inherent in recognizing the meritorious performance of individual faculty is the need to clearly outline performance expectations *vis a vis* teaching, research, and service, and to monitor, reinforce, develop, and evaluate such performance. Further complicating this dynamic are the changing institutional priorities (often beyond the individual control of the faculty member), disparate preparation faculty in engineering/technology disciplines have related to performance capabilities, and the largely-independent nature of faculty work itself—meaning that, for most faculty member, work occurs in isolation from other faculty colleagues at their institution, and milestones to have performance acknowledged or evaluated often occur only once a semester or academic year.

The move toward more person-focused pay is not exclusive to higher education environments. Indeed, many organizations in which engineering/technology students will be expected to work rely upon pay that acknowledges meritorious performance outcomes. The very nature of faculty work—a true example of the creative, autonomous nature of knowledge-based work—requires attention to person-focused pay. Such pay might be based on specialized knowledge, skills, or competencies; the depth of the knowledge or skill; the frequency and nature of faculty contributions; and other compensable factors such as effort, responsibility, or working conditions required or exhibited as part of faculty work.[16] Given the applied nature of engineering/technology faculty work, there are increasing linkages between faculty work and the broader economic development initiatives of an institution or region.

Linkages Between Faculty Work and Broader Economic Development Initiatives

Professor Richard Florida of Carnegie Mellon University coined a phrase that has gained prominence in academic and economic development circles during the past few years – the *creative class*.[17] Florida states that the creative class is a "fast-growing, highly educated, and well-paid segment of the workforce on whose efforts corporate profits and economic growth increasingly depend." His research has demonstrated that some urban areas across the U.S. are experiencing a large-scale re-sorting of people with certain cities becoming Mecca's of the creative class while other cities remain stagnant with mainly working- or service-class people. Urban areas fortunate to have a high concentration of the creative class are less likely to suffer from the issue of spatial mismatch since those in the creative class tend to be highly skilled and educated and gravitate toward locales where they find gainful employment. Unfortunately, according to Florida, there is not much of an overlap between the large cities (MSA's reporting populations over 1million in the 2000 Census) with a large creative class and those composed mainly of a working or service class, meaning cities without a creative class lose any competitive advantage in sustainable development. Thus, metropolises that have institutions of higher education with a focus on engineering and technology should take proactive action to engage their faculty in the enhancement of the broader economic development climate.

To maximize the benefit of engineering and technology faculty, states and municipalities can engage in partnerships with institutions of higher education thereby establishing a symbiotic relationship that targets high-tech, high-growth industries. For example, businesses that employ high-skilled jobs and specialize in high-tech products factor in the caliber of the research environment at area colleges and universities when making location or expansion decisions. States and municipalities with a thriving collegiate research environment are more likely to have the extant skilled human capital necessary for many of these industries to perform effectively. Furthermore, engineering/technology faculty can play a critical role in the research and development of these industries. Indeed, without the innovative research of engineering/technology faculty, the technology transfer process would struggle. The classroom and research lab are where a state's competitive economic advantage can either excel or flail.

The third wave of economic development has ushered in a new era of establishing partnerships and strategically targeting industries in order to gain a competitive advantage.[18] Economic development officials at the state and local levels now engage in close consultation with businesses, governments, nonprofit organizations, and schools (both secondary and postsecondary) in order to map out a competitive way forward for their respective jurisdictions. Engineering/technology faculty will play an even greater role in any strategic economic development plan as the overall economy becomes more knowledge based. Likewise, the ability to find and keep engineering and technology faculty will become even more critical. Through financial assistance like fellowships and grants, both state and local governments and the private sector can help attract and maintain these members of the creative class. With partnerships among various stakeholders starting to prevail in economic development strategy, the key to finding, keeping, and motivating engineering and technology faculty will require similar collaboration. Government, private sector, and education officials all must work together to ensure both success at the individual stakeholder level and on the overall economic development front.

Implications and Considerations

Whether or not postsecondary institutions successfully cope with the challenges and opportunities of a continuously changing environment will be a function of their responsiveness and elasticity, and their ability to engage in systematic processes of assessment, planning, and implementation. The challenge for engineering/technology administrators and faculty leaders, therefore, is to incorporate reward and recognition decisions around the strategic directions of the institution, and to recognize that, increasing, most institutions have placed greater emphasis on student learning outcomes, contributions to the advancement of knowledge in all of its forms, relationships with key community and professional stakeholders, and administrative efficiencies. Thus, decision-making processes in attracting, retaining, and engaging faculty must be mindful of the factors many of these institutions consider as they design for the learning needs of the future rather than the past: *organizing for learning*; *designing environments for learning*; *allocating resources for learning*; *communicating results of learning*; and *innovating through learning*.

First, organizing for learning requires institutions to rethink faculty roles, reward systems, and development opportunities. It also requires the alignment of people, processes, and technologies to support learning in all its many forms. Outsourcing non-core-competency functions that do not add value to the learning process must continue to occur.

Second, designing environments for learning requires institutions to rethink how learning environments are conceived, funded, constructed, and maintained. Far too many classrooms are still designed with lecture as the paramount pedagogic practice, yet teaching-learning processes are migrating away from this approach. Technological advances also make learning increasingly available anytime, any place, and on many devices.

Third, allocating resources for learning requires institutions to rethink resource allocation decisions. Determining what programs, markets, distribution channels, and approaches have the best potential to position the institution as a "learning environment of choice" requires tough decisions. The availability of easily substituted courses or services offered elsewhere can help bring clarity and focus to planning and decision-making. Again, allocating sufficient resources for faculty development purposes cannot be underestimated.

Fourth, communicating results of learning requires institutions to rethink how student, program, and institutional effectiveness is identified, documented, and disseminated. Already, numerous campuses have electronic institutional portfolios that report on progress, and many others are developing electronic student portfolios to capture and assess learning. Communicating the results of learning, and customizing that message to various stakeholder groups, helps to ensure, in part, ongoing support for and investment in postsecondary education.

Finally, innovating through learning requires institutions to rethink the specific ways in which they are unique, and to leverage unrivaled strengths in pursuit of leadership in certain fields of study. Identifying new and interdisciplinary fields of study, uniquely bundling and delivering content, and the brokering resources from many higher education (and other)

providers all serve to provide innovative approaches to the demands of future learners. Institutions must clearly identify and focus on what they do best, while automating, outsourcing, and, in some cases, discontinuing activities that retard change and innovation.

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