The Teacher-Scholar Model of the Department of Physics and Engineering, West Chester University

Description in Brief:

The Teacher-Scholar in Physics and Engineering is a faculty member who understands the subject matter deeply enough to select, structure and organize it so that it can be effectively communicated to students. This person demonstrates a commitment to creating new knowledge, to applying knowledge to solving problems or resolving issues, to synthesizing various strands of knowledge, to investigating and understanding how students learn, and to using experience with such scholarly activities to inform and guide instruction in the classroom and laboratory. Teaching and scholarship are complementary activities. Teaching can engender ideas that lead to scholarly activity, and scholarly activity can bring ideas and contemporary concepts into the classroom, and, more importantly, can spark enthusiasm for teaching and for the discipline. The challenge for faculty in Physics and Engineering is to develop in our students the ability to critically analyze past and current ideas, thus equipping them to recognize where new ideas are needed. Faculty engaged in scholarly activity can identify, inspire and nurture this creative spark in students.

Discourse and Context:

While it is true that one can teach traditional knowledge well without being engaged in research or make significant contributions to the discipline without being an excellent instructor, the Department fosters the goal for each of its faculty to strive for and achieve a balanced excellence in both teaching and scholarship. The Department understands that the balance adjusts throughout the career of the faculty member, and while teaching excellence is the faculty's primary responsibility, productive engagement in scholarly activities is also each faculty member's goal and responsibility in the context of the Teacher-Scholar Model.

Statement of Values Related to the Teacher-Scholar Model:

Physics and engineering departments at institutions of higher learning acquire their distinctive character by the capacity to form an amalgam between scholarship and teaching. Effective teaching involves not only the communication of an important body of knowledge, but also the creation of a capacity for criticism and self-examination. Scholarship involves the discovery of new knowledge, its integration and synthesis, and its application to new or persistent problems. Given West Chester University's strong and enduring commitment to its broad range of educational programs and its equally strong commitment to fostering the scholarly activities of its faculty, the Department of Physics and Engineering places a high value on effective teaching that

is informed by the scholarly activity of its faculty and on research that has an impact on the learning experiences of its students.

Formulating a description in detail of the Teacher-Scholar Model is difficult because the model must accommodate the distinctive characteristics of the wide range of specialties within the disciplines of Physics and Engineering. The balance of teaching effectiveness and scholarship itself depends on a variety of factors, including the nature of the research undertaken in any subspecialty, the role of students in the work, and the normal expectations during career progression. In some subdisciplines, faculty members are especially productive early in their careers, while in others, research output may depend on a long period of reflection and synthesis.

In a University, in contrast to a research institute or a community college, an obligation rests on every individual faculty member to embrace and embody the Teacher-Scholar model by both participating in scholarly activity and engaging students through instruction. In the University, no one can exclusively or permanently opt out of either responsibility. Participation in scholarly inquiry ensures that faculty members remain intellectually curious, vibrant and in touch with the current developments in their academic environment, an environment in which the values associated with the pursuit and advancement of knowledge can be transmitted. It is the involvement of each individual in both aspects of the academic mission of the Department and University that infuses the institution with the appropriate spirit of inquiry. In light of these necessities, if the Teacher-Scholar Model is to be the prevailing model for all members of the University Faculty, one of the implications is the recognition that all those who are engaged in teaching must be engaged in scholarly activities as well. A two-tiered faculty consisting of one group who both teach and are actively engaged in scholarship and another group of faculty who only teach is inimical to the Teacher-Scholar Model. The Department strives to foster the Teacher-Scholar Model by building a strong, competent faculty who are engaged in their intellectual advancement and in the instruction of our students.

The adoption of and the adherence to the Teacher-Scholar Model require that each faculty member in the Department and across the University make a commitment to both teaching and scholarship. This cannot, however, be taken as a requirement that all faculty have an identical balance of teaching duties and time available for scholarly endeavors. Faculty members bring their own strengths and interests to their work within the Department and University, and we should collectively be able to recognize these strengths and interests in the assignment of duties to individuals, to the extent that it is consistent with the requirement of involvement in both teaching and scholarly activity. Just as the balance between teaching and research in the work of an individual may reflect the particular strengths and interests of that person, the balance may vary over the course of a career. It may be appropriate for individual faculty members to pursue high-intensity research activities for some periods and other kinds of scholarly activity for others, to concentrate more on teaching at some points, or to take administrative responsibilities which restrict their ability to focus on either teaching or scholarly work. The exigencies of the Department may intervene to alter the balance at certain times, as, for example, when a revised curriculum is put in place, or when staffing problems force reassignments of teaching

responsibilities, or when a major reconfiguration of research activity is initiated. Ignoring either teaching or scholarship for protracted periods, however, is not in the spirit of the Teacher-Scholar Model.

In a University it is important, but not sufficient, to transmit to students a settled body of understood knowledge. Even at the undergraduate level, students ought to be introduced to concepts at the forward edge of Physics and Engineering and encouraged to engage in their own pursuit of knowledge. A list of skills or particular pieces of knowledge do not themselves characterize university graduates, but more generally they are characterized by habits suited to addressing outstanding intellectual problems. Instructors who are capable of creating an environment in which this result can be achieved, who are themselves active participants in the pursuit of knowledge through their own scholarly work, are potentially more effective in involving these ideas and skills.

Characteristics of Teacher-Scholars:

In the context of the Teacher-Scholar Model, faculty are challenged to undertake intellectual activity that stimulates both teaching and learning, forming an integrated process where various forms of scholarship complement teaching, where teaching fosters continued scholarship, and learning flows naturally from the relationship between them.

EFFECTIVE TEACHING IN PHYSICS INCORPORATES:

- classroom sessions characterized by organized presentations of ideas, demonstrations, or activities relevant to the goals of the course,
- the revision and re-examination from time to time of the organization of the course and incorporating innovative pedagogical approaches and new advances or perspectives on course-related ideas,
- occasional references to ideas related to, but peripheral to, the major ideas examined in a course. These references are intended to weave together ideas presented in the course with other ideas in the same discipline or related disciplines. The instructor's teaching also ought to be informed by the instructor's own scholarly work.
- an openness of the instructor to questions and comments regarding the ideas presented,
- a supply of out-of-class/lab assignments or activities which supplement, elaborate upon, and enhance ideas presented in the classroom or laboratory,

- the availability of the instructor outside of class and laboratory sessions to address at length course-related ideas and provide counsel and advice regarding strategies for success in the course,

- maintaining a set of standards and a level for the course appropriate for the material and a reexamination from time to time of the level and standards,

- an effective means of assessment and evaluation of each student's achievement in connection with course work, and

- an environment wherein the values associated with the pursuit and advancement of knowledge are instilled in the students

Because faculty members in Physics and Engineering are most familiar with the issues involved in teaching their disciplines, assessment of the teaching activities of a faculty member in the Department must include evaluations made by other faculty in Physics and Engineering. The perspectives of other faculty in related sciences and disciplines are also valuable in assessing the teaching effectiveness of a teacher-scholar in Physics and Engineering. The characteristics mentioned above are intended as a guide in making such an evaluation. Students, primarily because they lack the overarching vision of requirements imposed by the discipline and curriculum that determine the pace and format of a course, are inexperienced evaluators. Thus, the assessment of faculty colleagues is to be weighted significantly more heavily than those of students. Student evaluations sometimes provide useful feedback and are taken into account as a small component in evaluating teaching effectiveness. However, if a faculty member's scores on student surveys are within ± 2 standard deviations of the Department's averages, the scores are not statistically distinguishable from the averages and are not of significance. In this case, an evaluation of a faculty member's teaching effectiveness must rely on other measures such as peer classroom observation reports, a review of course materials and other items consistent with the Collective Bargaining Agreement and Local Tenure and Promotion Policies.

In addition, assessment of student learning outcomes at both the course level and program level is critical to the continued development and evolution of the Department. Although all faculty members in the department value assessment, there is a need to unify our efforts by having a faculty member serve as assessment coordinator for the Department. This faculty member will oversee the assessment at the program level, facilitate the collection and sharing of information at the course level, and represent the Department at College or University assessment events.

Research and Scholarly Activities in Physics and Their Assessment:

A scholar is an individual who contributes to the development and fostering of knowledge and whose activity is recognized by peers at the regional, national or international level. Though scholarship often is associated with the idea of pushing beyond the boundaries of what is currently

known, activities such as interpreting, analyzing and criticizing knowledge are also vital parts of the scholar's challenge. Scholarly work of many different types should properly be included in the balance of responsibilities within the Teacher-Scholar Model. These are reflected in our prioritized list of indicators of scholarly activities.

Broadly, scholarship in Physics and Engineering is creative, intellectual work that is validated by peers and communicated. The best scholarship is characterized by a critical review and evaluation by one's own professional community and by having members of this community use, build upon, and develop further these creative products of the mind. Scholarship in Physics is indicated by the dissemination of new knowledge or perspectives that contribute to the discipline of Physics or related disciplines or the practice of teaching in Physics or related subjects. This scholarly activity may include, but not be limited to:

- Publications. Peer-reviewed[1] or publisher-evaluated contributions and publications[2]. The quality of contributions by such a venue may be assessed by the stature of the journal or publisher disseminating the contribution, the relative importance of the contribution, and by citations or reviews of the published work. Collaborative associations and contributions to published work, acknowledged in the work or by testimonial of the author(s), although ranked after direct authorship of an original contribution, is also evidence of scholarly engagement.

- Proposals to and awards from funding agencies to conduct a scientific project or research program or to establish an innovative method of teaching ideas in Physics, Engineering or related subjects. Proposals which are eventually funded rank higher than those which do not receive funding. Reviewers' comments are also important in judging the quality and merits of funding proposals.

- Papers and presentations delivered to organizations or conferences. A measure of the quality may be obtained by an evaluation as in the case of publications. This category also includes participation in panels at regional or national meetings of professional organizations. Material presented on web sites, while not reviewed in some external process, may also demonstrate scholarly engagement.

- Consultancies. In such activities, the scientific acumen and expertise of the faculty member is utilized. The quality may be assessed by the degree to which the recommendations of the faculty are adopted and the degree to which they bring recognition to the Department

[1] "Peer-reviewed" refers to a process leading to a selection of experts in the discipline to evaluate the merit, importance, and originality of scholarly activity. This process can be selection by editors of anonymous referees to help decide on journal publications, and selection of anonymous referees by publishers to help decide whether to publish a book. It also refers to selection of journal editors of reviewers to write book reviews for publication in a journal.

[2] "Publications" refers to journal articles, books, conference proceedings, book reviews, reports, abstracts, and electronic media.

and the University. Although most often carried out in connection with technologically oriented businesses, consultancies also include reviewing manuscripts submitted for publication, reviewing grant proposals for a funding agency, organizing, planning or participating in professional workshops or panels, judging or moderating presentations or exhibitions, or reviewing books or academic programs.

- Testimony of established members of the discipline or in related disciplines.

- Continuing education beyond the terminal degree related to the discipline of Physics or to the duties as a faculty member of the Department of Physics

- Offices held in professional organizations.

The listing of these indicators of scholarly activities is not intended to exclude other forms of intellectual contributions which shall be recognized and esteemed as a consequence of developments and changes in the practice of the professional aspects of Physics.

SERVICE TO THE UNIVERSITY AND COMMUNITY

Service to the University and Community is an integral part of the Teacher-Scholar Model of faculty. The Department recognizes three categories of service: to the Department and University, to professional and academic organizations, and to the community. Faculty in Physics serve as resource persons within the Department, mentoring and assisting other faculty, especially the newer faculty and temporary faculty. Their talents and expertise are needed not only within the Department but in the wider University and Community as well. The following are non-proscriptive and non-exhaustive examples of service:

- Participation in Department meetings
- Participation in Department and University Committees
- Participate in Department recruitment activities
- Contribute to colloquia, lectures, panels or other presentations at the University or in the Community
- Voluntary membership or participation in community-based organizations
- Establish ties with area schools or assist groups within the community
- Any other service agreed to by APSCUF and the University administration

The Department does not prioritize the above examples of service, but leaves the venue to the interests and discretion of the individual. Service to the community includes, but is not restricted to, the application of pertinent knowledge to local, regional, state, national and international organizations. Professional and academic service to organizations includes organizing sessions at conferences, serving on boards and committees, serving as a discussant of presented papers, and serving on panels to review programs at this and other universities. University service also

includes student-based service and the contribution to faculty governance at the Department, College and University level.

Epilogue

A commitment to the Teacher-Scholar Model should be evident in all decisions which are made within the Department and the University. These include decisions as to recruitment and hiring of new faculty, and decisions about renewal of probation, tenure, and promotion. They would also include decisions as to work assignments made by the Chair for faculty and broader policy decisions about the curriculum.

At this moment in the University's history and in the evolving new systems for educational funding, it is crucial that we link increased scholarly activity together with excellence in teaching in the context of this Teacher-Scholar Model.

Disclaimer: This document is a work in progress, to be reviewed as needed by the Department. It is neither a prescription for success, nor a checklist for tenure and promotion, but rather a nonbinding guide for Department faculty. Provided herein are examples of what the Department of Physics and Engineering values in the areas of teaching, scholarship and service. It is understood that Department faculty cannot be evaluated by means of the model outlined above, and its use is voluntary for both the Department and the faculty member. Ownership of this document lies exclusively with the Department of Physics and Engineering, and no part of this Teacher-Scholar Model can supersede the Collective Bargaining Agreement, local APSCUF agreements and a Statement of Expectations. In accordance with the Collective Bargaining Agreement, teaching, scholarship, and service are characterized by review and evaluation by peers of the faculty.

Approved by the Faculty of Physics and Engineering
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