Best Practices Memo

Promotion and Tenure of Interdisciplinary Faculty

Introduction

Interdisciplinary research and education is an increasingly important feature of the academic landscape. A 2004 report commissioned by the National Academies notes that:

> *"In recent decades, the growth of scientific and technical knowledge has prompted scientists, engineers, social scientists, and humanists to join in addressing complex problems that must be attacked simultaneously with deep knowledge from different perspectives. Students show increasing enthusiasm about problems of global importance that have practical consequences, such as disease prevention, economic development, social inequality, and global climate change—all of which can best be addressed through [interdisciplinary research]. A glance across the research landscape reveals how many of today's 'hot topics' are interdisciplinary: nanotechnology, genomics and proteomics, bioinformatics, neuroscience, conflict, and terrorism. All those invite and even demand interdisciplinary participation. Similarly, many of the great research triumphs are products of interdisciplinary inquiry and collaboration: discovery of the structure of DNA, magnetic resonance imaging, the Manhattan Project, laser eye surgery, radar, human genome sequencing, the 'green revolution,' and manned space flight."* [1, p. 17].

The fields of computing and information science and engineering have a strong commitment to interdisciplinary work, with CISE researchers collaborating with electrical engineers in the design of low-power chips; with linguists in the development of natural-language processing systems; with biologists in the exploration of the genetic code; with economists in the formation of theories of on-line commerce; and with statisticians in the discovery of new ways to extract information from rich sets of data—to name just a few examples. Some of these efforts have even led to the establishment of new disciplines, such as bioinformatics and data mining. While "core" areas of computation—such as operating systems, programming languages, networking, and so on—will continue to produce key advances, there is an emergent agreement among computer and information scientists that close interactions with other disciplines are essential to the health and advancement of our field.

The agencies that fund research in computing and information science have also recognized the value of interdisciplinary work, and have begun to encourage or even require it. Recent examples, from the last half of 2007, include the NSF program on Cyber-Enabled Discovery, which teams computer scientists with physical and/or social scientists; the NSF program on Innovation and on Sustainable Digital Data Preservation and Access, which draws on the integration of library and archival science, computer and information science, and domain

science; a large number of active funding opportunities at NIH that require the collaboration of biologists and medical scientists with experts in bioinformatics and computation biology; and the IMLS/NEH Digital Partnership Program, which requires collaborations among libraries, museums, archives, universities, and other cultural organizations.

Not surprisingly, then, academic departments of computer and information science are increasingly recruiting and hiring people with interdisciplinary skills. Of the sixty-five advertisements posted to the CRA Job Announcement page between December 1, 2007 and January 2, 2008, twenty-four were either for a specific interdisciplinary area (e.g., bioinformatics, music informatics, robotics), or specifically mentioned that interdisciplinary skills were required or preferred. An additional five advertisements noted that the hiring department had strong interdisciplinary connections. While this indicates a healthy responsiveness in the field to the broader research and funding trends, it also poses challenges for both computing and information departments and their faculty. A particular challenge involves the tenure process for interdisciplinary faculty.

We are not aware of definitive research that evaluates practices in managing the careers of interdisciplinary faculty. Therefore, our recommendations are based on the shared experience of a large number of unit heads (including the authors) and anecdotal information on the practices of units with successful interdisciplinary programs.

The recommendations provided in the next two sections were developed to help department heads manage the life cycle of hiring, mentoring and promoting junior interdisciplinary faculty. The recommendations in the final section are aimed at the interdisciplinary junior faculty. While so focused, we do not ignore the influence that other players can have. Deans and provosts can promote interdisciplinarity by providing a clear signal of its importance, promoting tenure and promotion policies that are consistent with the recommendations below, and actively involving themselves in handling interdisciplinary careers. Senior faculty can shape the culture of the department by taking a broad view of relevant quality metrics, avoiding parochialism, and stepping up to the plate to provide the additional mentoring that young interdisciplinary faculty may require.

Joint Appointments versus Single-Department Appointments

Joint appointments in more than one department can promote interdisciplinary research and education and help faculty interested in such efforts. A faculty member with appointments in more than one department, being knowledgeable of both and able to bridge their cultures, can promote collaborations between the departments, thus contributing to the cultural diversity of both departments. The faculty may benefit from the ability to better collaborate with faculty in both departments, and teach and advise students in both departments.

However, junior (untenured) faculty with appointments in more than one department face significant additional challenges that must be carefully managed. (We are not considering "dry" or "courtesy" appointments here, but only appointments that carry a financial commitment from more than one department.) The difficulties include:

- Departments may have different appointment policies (9 months vs. 12 months); different expectations on the relative time spent on research, teaching and service; and different policies and practices on start-up funds, administrative and technical support, teaching loads, teaching buy-out policies, and so on;

- Teaching assignments are more complex;

- Unless there is very careful coordination among the departments, faculty may end up performing additional service;

- Faculty may have difficulty being considered an integral part of either of the departments in which they have an appointment;

- Faculty may spend a non-trivial amount of time traveling between departments;

  and perhaps most significantly:

- At the time of tenure, two promotion and tenure committees may have to be satisfied, and the norms and requirements of the committees in different departments may differ from one another.

Because of this, a number of universities avoid giving appointments in two or more departments to junior faculty, but instead hire them into one department and help them foster connections to other units; in such cases, the faculty members may shift to a joint appointment after tenure is obtained. We discuss single-unit appointments below.

Other universities have developed effective practices for avoiding or reducing the challenges that arise with a joint hire. Careful and explicit coordination between the chairs of the departments involved is essential, for example, to organize teaching and service loads and review requirements and progress toward tenure. Ideally, the chairs will meet at least annually to discuss this coordination. Also, steps can be taken to lessen the handicap of having to satisfy two promotion and tenure committees, including:

- One of the two departments should be clearly designated to take the lead in handling performance evaluations, managing the promotion and tenure process, and initiating administrative actions. It may be better to have a 75%/25% split, rather than a 50%/50% split, to clearly signal that the faculty member's primary responsibilities lie within the lead department.

- If tenure is planned for multiple departments, if at all possible there should be a single ad hoc promotion and tenure committee of faculty from all the departments involved. If there is not a single promotion committee, the faculty member's "retreat rights" should be specified clearly at the time of the hire. That is, a decision must be made about what will happen if one department decides not to award tenure to the faculty member, while the other does. For example, it may be possible and desirable to make a commitment that the department awarding tenure will increase the level of the appointment to 100 percent. The faculty member may have a tenure-track position (Assistant Professor) in one department, and a non-tenured position (e.g., Research Assistant Professor or Affiliate Assistant Professor) in another department. The faculty member will then be considered for tenure in one department only, while the position in the other department will be reviewed and renewed periodically. In such a case, there should again be an agreement in writing that specifies retreat rights by spelling out what will happen if the second department decides, with good cause, not to renew the non-tenured appointment.

In any case, a detailed Memorandum of Understanding (MOU) must be drawn up among the units involved at the time of the hire, and the faculty member should be given a copy. It should specify the percentage of time to be spent in each unit; which units are responsible for start-up funds, moving support, and summer salary, if any; what the requirements will be for teaching and service within each unit; what the procedure will be for annual merit reviews; all details of

the third-year and tenure review (timeline, committee selection, elements of the review process, etc.); and retreat rights. Sample MOU templates are available on the Web [2].

In general, joint appointments after tenure do not cause the same types of problems; and hiring a newly minted Ph.D. into a single unit by no means precludes shifting his or her appointment to a joint one after tenure has been successfully achieved. The difficulties may also be less severe for junior faculty who are hired with several year s of experience and established research programs.

Interdisciplinary Tenure within a Single Department

Even when an interdisciplinary faculty member holds an appointment within a single department, challenges still may arise in the tenure evaluation. The single greatest difficulty is that faculty tend to judge other faculty according to the norms and criteria of their own discipline, and often departments tend to believe that their approach to research is the best one. This perspective can not only make it difficult for interdisciplinary faculty to receive a fair hearing, but if not managed well can cause tension and hostility among different faculty in a department that has hired people with different perspectives.

Even when faculty members conducting the evaluation adopt an open-minded stance, it may be challenging for them to calibrate the metrics for impact and academic success within another discipline, even a closely related one. An example that is readily recognizable to people in computer science is the value of conference papers in most CS areas (high) versus that in some CS areas (e.g., computational science), and in many other fields (low). In addition to the need to evaluate the types of research products—books, journal papers, conference papers, artifacts, and so on—it is also critical to understand the quality of each product. Which conferences are important? Which awards carry the greatest prestige? Which people are the luminaries whose letters of recommendation should be taken most seriously, and which are known to be hypercritical? What is the accepted style and focus of letters of recommendation? Which comments in a letter are irrelevant and which omissions are significant? In tenure cases, there is a great deal of implicit knowledge within a discipline that is taken into account that may be missing in interdisciplinary cases.

 Another challenge is interpreting the candidate's support letters. If a faculty member is publishing in multiple areas, it is likely that some of the referees will only have knowledge of a portion of the member's work. For instance, the roboticist who works in both computer science and mechanical engineering may publish in the journals of both disciplines, but the senior mechanical engineer who writes a letter on her behalf may only recognize a small portion of her work—that which was published in ME journals—and may view the candidate as having an insufficient body of research relative to other mechanical engineers.

Finally, it is increasingly true that interdisciplinary research takes place in research centers and institutes that are affiliated with the university but separate from the department. As a result, even a faculty member with a full appointment within a particular department may spend a significant amount of time at such a center or institute, rather than in the department; may work more with professional researchers rather than students—and, indeed, may have a reduced teaching load as a result of financial support from the center; and may be more focused on playing a role in a big project, sometimes at the expense of publishing.

To mitigate these difficulties, the steps enumerated below are useful. Note that many of them also apply to faculty with joint appointments.

- Provide adequate mentoring to all junior faculty, but especially those whose research areas are interdisciplinary. In particular, junior faculty should be given clear guidelines about what is expected and valued by a particular department; for example, they should not be surprised to learn, in their fifth year, that the department does not recognize some publication venues as valuable for tenure. It may be necessary to provide two (or more) mentors to ensure coverage of the different areas in which the faculty member works. Having a mentor who has conducted interdisciplinary research can also be very useful. If a faculty member is heavily involved in a center or institute, it is especially important to provide advice about how to balance work on large team projects with work that establishes a strong individual scientific reputation.

- Provide particular guidance in navigating funding: somewhat paradoxically, while acquiring funding increasingly calls for interdisciplinary collaboration, most funding still comes from agencies that are known within individual disciplines. Thus, someone educated in computer science might not know about funding opportunities in IMLS; someone trained in biology who has moved to computing might not know about the CISE or CIO within NSF. In certain cases, it may be appropriate to provide more seed money to compensate for this handicap.

- A faculty member hired in an interdisciplinary position is more likely to be "first of a kind" in the department. The member may need to establish new research facilities, arrange collaborations with other departments, develop new courses that are possibly cross-listed in several programs, and train teaching assistants for these courses. Such faculty will have a higher overhead while being more isolated than faculty joining an established area. Be sure to provide adequate support and relief to compensate for this overhead; the same applies to any "first of a kind" junior faculty, but more so for those involved in interdisciplinary research and teaching. The isolation problem can be remedied by hiring more than one faculty member in a new area at the same time—in particular, by hiring a cluster that includes both senior and junior faculty.

- Assure that the feedback provided in annual and third-year reviews is detailed and specific, and provide it in written form as well as conveying it verbally.

- If possible, involve people from different disciplines in the annual merit review and the third-year review of an interdisciplinary faculty member. This will not only provide higher-quality feedback to the individual being reviewed, but will help educate other senior faculty participating in the review (e.g., the department chair) about the norms and values of the other disciplines to which the faculty member contributes.

- Similarly, in the evaluation of the promotion and tenure dossier, involve an outside authority with expertise in the other discipline(s) relevant to the faculty member's interests. If the unit selects an ad hoc promotion and tenure committee for each candidate, then this external person should be member of the committee; if the unit only selects evaluators for the promotion and tenure dossier, then the external person should be one of the evaluators. Be sure that the outside member plays a significant role in selecting the referees who will write letters evaluating the candidate. Also task that member with helping to make sure that the promotion and tenure committee itself, as well any faculty who will vote on the tenure case, understand the values and norms of those other participating disciplines. It may be helpful to write down metrics for judging academic success.

- When a faculty member is involved with a center or institute, develop mechanisms that include the participation of representatives from the center/institute in the third-year and tenure reviews.

- Educate yourself and educate the promotion and tenure committee on the standards of scholarship and research methodologies in the relevant disciplines.

- When you forward the tenure dossier, convey to the college promotion and tenure committee the most important implicit information needed to evaluate the tenure case.

- In requesting letters of recommendation, consider including wording that specifically asks the letter-writer to evaluate the candidate on the basis of his or her own area of expertise, while recognizing that the candidate has conducted interdisciplinary research.

- Anticipate that the tenure case will take longer to prepare and evaluate than purely disciplinary cases, and plan accordingly. It will take more time to select the promotion and tenure or evaluation committee, more time to select the letter-writers, and more time to evaluate the dossier.

Note that a number of these recommendations also apply to faculty without interdisciplinary interests: do for your interdisciplinary faculty what you would do for all junior faculty—meet to discuss career goals, provide thorough periodic evaluation, provide guidance and support, match teaching and service duties to career needs, and so on—but do it even more intensively.

Most important, remember that faculty are not hired to do research in a narrow area of their discipline. A faculty member is not derelict if he or she decides to change areas to start working closely with colleagues in other departments. Rather, faculty are hired to do outstanding research and teaching, wherever that leads them.

Young Faculty Interested in Interdisciplinary Research

Young faculty candidates who seek to pursue interdisciplinary research should keep in mind that different departments have different cultures that may encourage or hinder interdisciplinary research. When interviewing in a department, one should seek information about the formal and informal attitudes toward interdisciplinary research: Does the department encourage joint appointments? Does it use any of the methods listed above to encourage interdisciplinary research? What fraction of the faculty engage in interdisciplinary research?

Finally, while tenure is a very important goal for a young faculty member, it should not be the one and only goal. The probationary period is the beginning of a career that will span several decades. A faculty member should spend the probation time best preparing for this long career. Achieving tenure in the current department will often be an essential step toward achieving career goals. However, in an extreme situation where a faculty member wishes to pursue a research direction that is not supported by the department, it might be preferable to seek a more conducive research environment elsewhere.

End Notes

[1] *Facilitating Interdisciplinary Research*, The National Academies Press (2004). Available on-line at http://www.nap.edu/catalog.php?record_id=11153.
[2] http://www.provost.umich.edu/faculty/joint_appointments/Joint_Appts.html

[3] *Report of the Provost's Ad Hoc Advisory Committee to Evaluate the Cluster Hiring Initiative at the University of Wisconsin-Madison*, Nov. 11, 2003. Cited in [1, p. 101].