

Mentoring of Graduate Students in Interdisciplinary Programs at Purdue University

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Mentoring interdisciplinary students is a university obligation deserving of our best effort. Empowering students to tackle problems that span multiple disciplines is becoming more and more important as the complexities of society expand. Whereas many of the important advances in the past were made by single individuals in traditional fields, today we are seeing research teams leading innovation and discovery in a space where broad prerequisite skill sets are essential. It comes as no surprise that interest in interdisciplinary research at Purdue University (and elsewhere) is increasing. In fact, within the Graduate School's Office of Interdisciplinary Graduate Programs (OIGP), enrollment has increased by 74 percent over the last seven years. In conjunction with this growth comes the responsibility to assure students in these programs receive proper academic guidance, meaningful career counselling, and high quality research advising.

Universities are often challenged in meeting this responsibility because interdisciplinary programs typically are not structured with direct faculty lines, departmental teaching assistantships to support students, and a sufficient number of faculty advisors equipped to provide multidisciplinary career guidance. While quality mentoring is critical for all students, it is particularly important for interdisciplinary students because of the often unique environment in which these students are situated. In contrast to traditional disciplinary programs where degree titles are well understood externally by employers in industry, government, and academic sectors, interdisciplinary degree titles are often not well understood in terms of what specific skills graduates of these programs possess. So, some specific coaching and counselling on how to sell one's self can be very helpful to students when applying and interviewing for job positions.

Students in interdisciplinary programs can find their access to resources limited, relative to other students. We see this typically when a grant expires and a student needs a teaching assistantship or departmental research assistantship to bridge the gap between grants. Rarely do we see traditional departments step in to assist interdisciplinary students with support because these students are perceived as being outside of the departmental program. Furthermore, interdisciplinary students can feel at times disconnected from the university grid in the sense that many of the communications channels to graduate students that provide important information about deadlines, professional development opportunities, special campus programs, and so on are overseen by departments who may not include interdisciplinary students in their communications.

Interdisciplinary programs at Purdue can differ significantly in terms of their operating models, which can make a one-size-fits-all approach impracticable. Nonetheless, we prefer to address these issues or at least oversee these programs centrally. In this way, we help assure that interdisciplinary students are consistently receiving the mentoring and support they need.

At Purdue University, sixteen interdisciplinary degrees are housed in the Office of Interdisciplinary Graduate Programs (OIGP). These programs offer master's and PhD degrees, and can have different administrative structures. OIGP programs include many STEM-oriented degrees such as Biomedical Sciences, Computational Life Sciences, and Information Security, as well as programs with a liberal arts flavor, such as American Studies, Comparative Literature, and Women's Studies. In addition, a new OIGP interdisciplinary PhD program was just approved that is completely customizable. Initially motivated by the interest in providing faculty members working in Discovery Park centers on campus with a convenient way to engage talented students in PhD research, the interdisciplinary PhD program allows students to identify an advisor and together select a thesis committee and define a plan of study. This flexibility has many obvious benefits, particularly for ambitious students seeking to explore solutions to grand challenge problems. As mentioned above, there are mentoring challenges associated with running these programs, which we attempt to manage. We have learned a number of lessons along the way, which are shared in the remainder of this article.

The administrative model that has generally worked best on the Purdue campus is the one used in the *Purdue University Life Sciences Program* (PULSe). Students in PULSe are admitted directly into the program, which is organized around ten training groups (TG's), involving more than 200 faculty members from 30 different departments. Each TG has an Executive and Curriculum Committee to provide oversight and one-on-one advising to the students. PULSe is structured to provide a common set of basics relevant to each Training Group while providing flexibility for students to appropriately customize their programs in accordance with their individual interests. Recognizing the importance of exposure in making good decisions, students are directed to explore several training areas and are required to do laboratory rotations before selecting their PhD research topic. After the student has chosen an area, an advisor is identified, along with a thesis advisory committee. An important feature of PULSe is that the department of the thesis advisor becomes the official department home of the student. This enables the student to have a convenient connection to a department (and department resources) without the additional departmental constraints and requirements that may not be appropriate for interdisciplinary research.

The new Interdisciplinary PhD program has even more flexibility and includes the same important feature that the home department of the thesis advisor serves as the departmental home for the student. The transcripts for students who participate in these programs clearly indicate the interdisciplinary program affiliation in addition to the department name.

Some Lessons Learned

There is value in having academic flexibility within an interdisciplinary program—flexibility that allows the thesis advisor and committee some latitude to tailor the plan of study to the interests of the student. This typically involves getting departments to agree upfront to entrust participating faculty mentors with this responsibility.

Mentors serve the students well by teaching them how to market themselves externally to different types of audiences. This involves helping the students learn and/or discover what specific qualities and skills a particular employer may be looking for.

It is valuable to have mentors expose students to discipline-specific as well as interdisciplinary outlets for presentation and publishing. More often than not, these communities are different and have dissimilar cultures. Interdisciplinary students should be navigating both of these communities and associating with the appropriate professional societies right from the start. Mentors should view themselves as career guides.

Students benefit greatly when mentors help them seek out and secure external funding. There are funding opportunities for students who wish to engage in “translational” research, but sometimes these opportunities are not apparent to the students. Good mentoring and advising is key.

Engaging interdisciplinary program alumni/ae as role models and mentors can provide valuable career insight for enrolled students. A simple way to do this is to invite alums to campus to give seminars and for panel discussions. The alums often have good stories to share and can speak about opportunities. Furthermore, they can be a resource for internships and employment connections.

Another practice we’ve found to be effective is providing recognition to outstanding mentors. At Purdue, the Graduate School has enlisted the provost to present graduate mentoring awards to a couple of faculty members during a formal ceremony which is held annually. This award recognition helps reinforce the importance we place on quality mentoring.

Finally, we’ve found tremendous value in having mentor training. Every new faculty member is required to attend a mentoring workshop run by the Graduate School. During the workshop, we cover all the essential elements of effective mentoring, career counselling, strategies for staying current, avoiding pitfalls, promoting student success, and more. This has helped provide a more uniform level of mentoring across all disciplinary and interdisciplinary programs.