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Professional Development for Grad Students in Geological Sciences

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These days it is important for all departments to take a more active role in the professional development of our graduate students. The academic positions that we professors know the most about are increasingly difficult to obtain, and the criteria needed to be successful include things we never had to do and thus cannot advise about (eg teaching portfolios). Many of our grad students are finding employment in government or the private sector, but we professors tend to be ignorant about these kinds of opportunities and thus how to prepare our students. The Sheridan Center does an excellent job of offering professional development seminars to help grad students prepare for many aspects of academic applications, and Career Development is increasingly involved in helping graduate students seeking jobs (especially non-academic ones). However, many aspects of job searches are highly discipline-specific, and to be effective one must know the culture of the discipline. There is no substitute for direct department involvement.

I would like to briefly describe some of the ways in which the Geological Sciences Department contributes to the professional development of its graduate students, with the hopes that sharing our experiences might provide useful ideas and encourage others to share their own experiences and programs.

Overall, grad student professional development starts from day one; it is in part a cumulative process that depends on the daily models, enthusiasm and encouragement that faculty, staff, more senior grad students, and alums provide. In addition, some specific and focused programs for senior grad students are helpful. Below I briefly describe some of the indirect aspects of professional development in our department, as well as several more specific programs.

Models: Professors should model high standards as well as strong support for all aspects of the personal and professional growth of their grad students, and should express enthusiasm for a variety of careers (not just academic). Advanced graduate students set the tone for beginning ones, in part via social activities as well as service on departmental and university committees, and community outreach. Three 2nd year grad students serve as Geo Club presidents and help entering grad students with housing and orientation; they also organize various social events such as the annual fall and spring picnics and holiday party. In addition, there are 4 senior grad student representatives who attend all faculty meetings (except those dealing with hiring and promotion). They also participate in interviewing new faculty candidates, and thus have seen the process from the 'inside'. Departmental staff (secretaries, administrative assistants etc) also contribute to the training and professional development of grad students.

Clear expectations & uniform standards: Our department gives to all incoming grad students a handbook that collects together a wide variety of important information. This handbook (also available on our web site) clearly states departmental practices and policies, thus avoiding misunderstandings that could arise from hearsay. There is a major section on academic affairs, including:

1. forming a research advisory committee
2. coursework
3. requirements for the MS and for the PhD
4. the PhD preliminary examination
5. writing the thesis

There is another major section dealing with other matters, including:

1. departmental facilities and equipment,
2. security, safety, health insurance and taxes
3. letters of reference
4. career planning

Each graduate student forms a research advisory committee of three faculty soon after arrival, and these meet at least once a semester; the purpose is not to 'judge' the student but rather to offer personalized advice. In addition at the end of each semester the entire faculty meets to go through all of the grad students in the department, individually, to discuss their progress in coursework and research, in the light of their own professional goals; the main advisor composes (and the department chair approves and signs) a letter to the student based on this meeting. These meetings provide timely feedback to students on their progress and serve to identify problems at an early stage so that appropriate adjustments can be made. They also ensure uniform treatment of all students, and allow the entire faculty to contribute to the professional development of each student.

Communication: Written and oral communication skills are essential for success in any job or career, and we emphasize communication in teaching as well as in research. Our department strongly encourages all grad students to participate in Sheridan Center programs and obtain their Teaching Certificate. We have a department committee (one faculty and two grad students) who provide orientation to new grad students concerning department as well as university educational philosophy, who administer microteaching sessions (required for all our new TAs), and who run additional meetings during the year to discuss teaching issues and careers. In addition many of our grad students have been active in the past 2 years in outreach science teaching at Vartan Gregorian school, and many of them help to mentor and advise undergrads doing senior theses.

Obviously teaching experience is important for any academic job. One semester of TA-ing is required for our PhD students, and most do 2-3 semesters. We try to match the students to the courses whose content they are most expert in, and we also try to give them experience with both introductory and upper level courses. In many courses the grad TAs are partnered with an undergrad TA, who provides useful insight into how the course ‘works’ from someone who actually took it recently. TAs are encouraged to sit in on the lecture part of the course, to provide greater connection between lectures and labs and to give feedback to the professor, and senior grad students are commonly invited to give at least one lecture in the class.

In terms of research communication, there are many opportunities to practice, get feedback, and improve. Each research group in the department has a weekly ‘lunch bunch’ meeting where grad students as well as faculty, postdocs and occasional outside visitors make semi-informal presentations of research in progress. Almost all grad students go to at least one regional or national (or international) meeting each year to present a poster or talk on their research. They always give one or several practice presentations before they go, and get extensive feedback from faculty and their peers on all aspects of their presentation. (The chance to be a ‘reviewer’ as well as a presenter gives valuable perspective.)

Contacts and networking: An important part of professional development involves contacts and networking beyond the home department, and we offer many types of opportunities to our students. We have a weekly colloquium series, where visiting researchers give talks on topics related to but also outside the research specialties in our department. There are opportunities for grad students to meet individually with these visitors. In addition, national conferences and meetings are extremely important for making personal contacts and networking. Our department hosts an alum reception associated with one of the national meetings that most of the department attends; this reception provides opportunities for alums to reconnect with faculty, and for current students to meet and learn from alums who have had experience in a variety of postdoc positions and jobs. Overall, our department stays in close touch with our alums (undergrad as well as grad students); every year we put together and send a newsletter to all alums, with current news and photos from the department as well as news notes sent in by alums.

Grant writing: Almost all professors have their grad students read the NSF, NASA or whatever agency grant proposal is supporting their research, and many professors involve their grad students in helping to write parts of new proposals. In addition, when students take their PhD prelim exam (in the 5th semester for an entering AB or 3rd semester for an entering MS) they must submit a mini-research proposal as the written part of that exam. Also, in some grad courses the professor requires a research proposal as the final 'term paper'.

Deciding what jobs to pursue: All of us professors are knowledgeable and enthusiastic about our jobs and so we may tend to unconsciously convey the impression that we will regard grad students seeking other types of jobs as somehow less worthy. It is very important to not only explicitly convey support for a wide variety of possible careers, but to become educated ourselves about options and to communicate them to our students. There are several ways in which we try to do this (although we should do even more).

Our alums (both undergraduate and graduate) are an invaluable source of information and advice, so it is extremely helpful to have updated alum files available in the department. For example, if students wish to contact alums who are working for an environmental consulting firm, they can get a list of these alums with contact information. In addition, once a year we organize a Geo Careers Day in place of our normal weekly colloquium. We invite 3-4 alums (both undergraduate and graduate) who have pursued non-university careers, and ask each of them to present a ~15 minute description of their career trajectory, what they like about their (past and present) job, and any advice they might have for current students. We take questions from the audience, have some panel discussion, and after ~1.5 hrs adjourn for a buffet dinner which gives students the chance to talk to the panelists individually or in small groups. This event is extremely popular and well-attended, and serves to educate faculty as well as students about career options in government and the private sector as well as other types of academic settings.

About 4 years ago we initiated a series of Professional Development Seminars for our graduate students. These are held at the noon hour, about 2 per semester, on a variety of topics. The grad students themselves are responsible for identifying the topics they would like to have discussed, and for inviting 2 or 3 faculty to come give brief presentations and participate in discussion. Examples of recent titles include:

1. Career options, steps and goals
2. Preparing for life after Brown
3. The scientific community
4. The scientific literature
5. The funding of science
6. Scientific ethics
7. Academia or not?

The grad reps compile a list of questions on the given topic they would like to see discussed, and give it to the faculty about a week in advance.

Cover letters, CV, portfolio, interviews: When graduate students are in their last year, and are thinking actively about seeking post doc positions or academic or other jobs, their faculty advisory committee can be helpful in suggesting specific personal contacts (and providing introductions at meetings and conferences).

The Sheridan Center Professional Development Seminar (Teaching Certificate III) on the Teaching Portfolio is extremely helpful, for the expert guidance and personal help provided by Janet Rankin and Laura Hess, and for the discussion with other participants, as well as preparation of the finished product.

The 'culture' of what is expected in cover letters, CVs and interviews does vary among disciplines. Our department maintains a notebook in the main office with copies of cover letters and CVs contributed by recent alums, from their successful job searches. In addition we have started asking our recent alums to write a brief memo with any general or specific advice they have on the whole job search process, based on their own experiences.

Our grad students observe faculty candidates interviewing in our department: they attend the talks, meet with them to ask questions, and write up an evaluation to give the search committee. Students who obtain interviews are given a lot of guidance and help in preparing their talk(s), primarily by their thesis advisor and other senior grad students.

Recently there have been discipline-specific professional development workshops and short courses, some funded by NSF, available at national meetings or in the summer. Some of these workshops include presentations by NSF personnel about grant applications and other practical matters.