

EARLY CAREER

The Early Career Section offers information and suggestions for graduate students, job seekers, early career academics of all types, and those who mentor them. Angela Gibney serves as the editor of this section. Next month's theme will be getting ready for the academic job market.



Working with Students

PhD Advising before Tenure

Dan Abramovich

The early-career challenge I was tasked to address is:

Entering into an academic advisor-advisee relationship and remaining happy enough afterwards to do it again.

Dan Abramovich is a professor of mathematics at Brown University. His email address is abrmovic@math.brown.edu.

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One answer to this question I want to stress is this:

Seek and heed the advice of your colleagues.

It certainly worked for me. The rest of this text may be seen as a guide on which advice to seek.

All you need is one or two committed colleagues to look over your shoulder and see that things are progressing well. Also, if your department is one which is committed to shepherding a tenure or promotion case through to a successful conclusion, it is in the department's interest to present the best possible case to the university, as it reflects well on everybody in the department. So chances are people will step up.

(1) Am I ready? If you have a long-term position, if you feel your own research is going well, and if your research is appreciated by colleagues, you probably are ready.

Or stated differently: If you have, or expect to have, results you would be proud to share with a colleague and publish, you are ready.

(2) When ready, start slowly, one strong student at a time. Before taking on a student ask your colleagues if they think the student being considered can do it and whether there are major issues to worry about. The director of graduate studies and various graduate course instructors will know. Or perhaps an overburdened advisor may hand over a student to you, certified as a strong student.

As a nontenured faculty member you will get loads of credit for shepherding a single successful thesis, with diminishing returns for additional ones. So take one student at a time, and stack the cards in your favor.

At some point in your career you will hopefully share the task of advising students with various issues. This is not your responsibility as a nontenured faculty member.

(3) Be generous with your ideas. Nontenured faculty are often worried where they might get thesis problems for their students—certainly I was. I believe if you have a solid research program you can simply involve your student in it. You will both get credit for the results.

There is more than one way this can be done. One model that works is that you finish a paper on your own which leaves some interesting cases untreated or some interesting generalization expected. This can be assigned to a student. In another, you coauthor a paper on a result you are working on anyway. If needed, there is likely to be a remaining direction for the student to follow, demonstrating the ability to work without your direct participation. But don't worry about it before you start.

Later in life, one gets to have students working on more distant projects. For a nontenured faculty member I would suggest doing this only in a shared advising scheme (see below).

(4) **Be patient with your ideas.** Say you have a meeting with a student and you suggest a way to solve a problem. Possibly you know that this, or something like it, works. But your student seems not to get it. What should one do? I suggest that you persist. Suggest the same or similar idea, possibly from a slightly different angle. Repeat during your next meeting. And be patient.

At some point your student will take your idea and build a result on it. A good student will take it further than you thought, and you'll be quite pleased. But be careful—never say, "I told you so." It might so happen that after a month your student comes back with a great idea, which you happen to recognize... please don't mention it! Realizing at any point of your career that an idea you thought was yours actually came from somewhere else can be quite humbling. I know—it continues to happen to me all the time.

(5) **Shared advising.** Sharing a student with an experienced advisor is a great way to start. With shared advising you can start before you have a tenure-track appointment. You will get to learn things from your colleague while advising (and not just from your student). It allows your single student to be part of a possibly larger group. It is also a great way to continue—after a student gets a result, why not explore a wider range of ideas and tools? After all, it is harder to pick those up later in one's career.

(6) **Good practice.** Have a weekly meeting. Send students to workshops and conferences. Suggest that your student subscribe to the relevant preprint archive... in short, read the edition of this section of the *Notices* advising students how to choose a good advisor, and how to be a good advisee, and turn the mirror to yourself.

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Dan Abramovich

Credits

Author photo is courtesy of Lori Nascimento.

Casual Mentorship and the Strength of Weak Ties

Natalia M. Pacheco-Tallaj

Let me start by sharing some anecdotes, from me and other students, of meaningful mentorship experiences that we feel have particularly impacted our mathematical lives in one way or another:

- "I sent a professor an email asking a question about hyperbolic 3-manifolds. He told me to drop by his office hours and we talked about hyperbolic geometry. He posed interesting questions, helped me understand the development of the discipline, and gave me some direction on what to read. I came to his office one more time, and we did not meet again. But after those two days, I had a clear plan on how to work up to the papers I wanted to read in hyperbolic knot theory."
- "A professor reached out to me and other womxn in the department via email to have a conversation about department culture. We all got lunch together and brainstormed ways those of us at each level (student, postdoc, faculty) could contribute to making the department more welcoming for people at our stage. We each went off and put some things into practice, and we know our doors remain open to each other whenever we need to brainstorm in the future."
- "At department teatime, a postdoc asked me what I was doing in the summer, and based on my interests, recommended I attend the PCMI Summer School, which I had not previously heard about, and gave me advice on applying. I have not talked to this postdoc since, but I did go to PCMI, where I found both research advisors and the area of research I want to pursue in grad school."
- "I went to a professor's talk with plans to meet with him after. What I thought was going to be a one-hour post-talk conversation turned into several hours of excited math chat over two dinners on two different days. It's been a while but this remains one of my best mathematical memories."

All of these interactions have had an impact on students' mathematical lives: a fond mathematical memory formed, a new discipline learned, a plan of action formed, or new opportunities discovered. Yet they each required less than a few hours of commitment from the mentor.

Natalia M. Pacheco-Tallaj just graduated from her undergraduate studies at Harvard and is starting her graduate studies at MIT. Her email address is nataliap@mit.edu.

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