The Early Career Section is a compilation of articles that provide 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 work-life balance.

Mentoring

Developing Relationships with Experts[1]

Have you ever had the impression that a mathematician should be a lonely superhero who conquers all challenges by their own strength? Have you heard that a good mathematician should not be very social? There certainly are legends from long ago, where things could be like that (before computers, phones, and planes), but nowadays the great superheroes are known to rely on one another and hang out together (think about the Avengers and the Justice League). All joking aside, developing relationships with experts in your field can be extremely beneficial, especially for the evolution and progress of one's research and for finding a job early in one's career.

Let us first talk about how to find an expert in your research field. It can be a person who came up with the conjecture you are working on, or a person who has solved a related problem, or someone whose work you want to study in detail. It might sound easy to track down such a person, but in reality it might not be that simple for a beginning graduate student to figure out who such people are. In this case do not forget your advisor, who in a sense is the first expert you will ever encounter. Your advisor can certainly guide you to a number of experts in the outside world. Similarly, former students of your advisor can also be a natural option to consult first. After identifying one expert, you may reach out to more experts from there, just like a snowball effect.

After locating an expert, how do you initiate contact? Well, you might be concerned about disturbing a senior mathematician even by email, or you might be afraid of introducing yourself to a famous speaker at a conference. No worries—let math speak for you. To make a (perhaps inappropriate) analogy, if this were a blind date, then math would be your mutual acquaintance. For example, if you post a paper on arXiv, you may alert a group of experts about it and write to them to ask for comments. If you read a paper and are confused on some points, after seriously thinking to avoid asking trivial questions, you may email the author(s) for further discussion. If you hear an interesting seminar talk, you may raise some questions afterwards or chat with the speaker at the seminar dinner.

Just like developing any kind of relationship, occasionally you might be disappointed if nothing useful happens from the expert you contact. But more often than not you will receive an encouraging response with enlightening suggestions. Even better, you might be invited to give a seminar talk about your work and communicate with the expert in person. Such communication can very likely be the starting point of a new project or a new collaboration in your career. Disseminating your research to other people in the field can only help and never hurt.

One cannot interact with experts every day: Most of your time is spent thinking on your own and working independently. When should you contact them? A natural

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time to reach out to experts is of course when you finish a project and can share the results. By sending your work to people and talking to them about it, new avenues on which to travel toward next projects can become apparent.

Perhaps the most crucial moment to reach out to other researchers is when you are about to start looking for jobs in academia. As a fresh PhD, probably your name is little known in the field. But you can change the situation by informing relevant experts about your thesis results and inquiring about job information at their institutions along the way. Moreover, if your advisor can help advertise your work, that can also be quite useful. If a member of a hiring committee knows about your work, it can significantly increase your chance of getting the job.

As in any relationship, one needs to be thoughtful. Time is precious to everyone. Do your homework and fully prepare before talking to an expert. If you ask a question via email, make sure to formulate it concisely. If a conference speaker can meet you for only an hour, think in advance how to use this time slot: Which results do you want to mention? How can you explain them concisely? What questions would you plan to ask? Would you like to focus on technical details or get a sense about general ideas? This kind of preparation can also be good training for you to summarize your past research and figure out future directions.

As a concluding remark, one should not network for the sake of networking. Developing relationships with experts is like watering and fertilizing your career, but the foundation beneath everything is still your own mathematical achievement.

Dawei Chen

Credits

Author photo is courtesy of the author.

Adventures in Mentoring[2]

I started mentoring students and postdocs thirty years ago as a young assistant professor at Cornell. This continued after I moved to Berkeley in 1995, and I now enjoy working with young scholars in Germany. I always thought of mentoring as one of the best parts of my job.

With these notes, I'd like to share some anecdotes and experiences. These might be useful for colleagues who are starting their first tenure-track jobs and will perhaps be entertaining and thought provoking for all readers. Before beginning, I would like to use this opportunity to thank all my students and postdocs. I learned a lot from you. Please continue to teach me.

- **Doing the Opposite.** My first PhD student was older and more experienced. He came to my office once a week, for an entire afternoon, asking me for my advice on his research. I eagerly offered my advice. After leaving he did precisely the opposite of what I had suggested. The same happened the following week. I recommended A; he did not-A. The same events, week after week. I was puzzled. Is that what it meant to be an advisor? The answer is yes, for this particular student. Having already made up his mind on what to do, he just needed me to test his ideas. And to debate. He became a successful professor at a top institution.
- **A Threat.** It did not go so well with another student. One day, he messed up badly in presenting some material in a graduate seminar. I told him what I thought, right then and there. He was extremely upset because he felt humiliated in front of his peers. He threatened to shoot me if I ever did this again. I learned my lesson and decided to be more respectful.
- **Finding Good Students.** Don't ever compare students at your current institution with yourself, from back when you were a grad student. Most students are capable and motivated. Don't worry so much whether they are "good" yet. It is your job to help them become good.
- **Being an Imposter.** When I was a postdoc, I could not believe my luck. Someone paid me for what I loved doing. But how come they missed that I was not qualified for the job? That worried me. I was sitting in seminars and did not understand. I went to the library, and the math books were incomprehensible. But everyone else seemed on top of it. I decided to wait and see. Surely, some day they'll discover that I am a fraud. But this has not happened yet.

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