

Supplemental Material S1. Faculty perspectives.

The following includes the perspectives and experiences from the point of view of a mid-career and an early career researcher. F = faculty.

F1: To be perfectly honest, my primary focus during my initial years as an academic was inclusion of graduate students into my laboratory efforts. Graduate student participation took the form of graduate research assistants who helped support my own work and thesis projects that aligned with my research areas of expertise. I was a bit slow to realize that with careful selection and guidance, undergraduate students can have a level of research interest and intellectual curiosity that rivals, if not exceeds, that of graduate students. They also often have more time than the masters students in Communication Disorders given their time consuming clinical training obligations.

After realizing that I was giving the same speech to every new student who joined my laboratory, an astute graduate research assistant put together a laboratory manual that summarized the typical research pathway that I have developed over many years. This pathway goes as follows:

- A. Start with research ethics training. Students are not allowed to engage in any research endeavor in my laboratory until they have completed the basic research ethics training required by our Institutional Review Board (CITI). If this is the extent of their interaction in my laboratory, they can put CITI training on their resume for graduate school applications.*
- B. Matching students to projects. Students are funneled into either individual projects or group projects with defined goals. If they are intellectually curious about the project, they will be more engaged.*
- C. Literature search training. I rely on our excellent library scientists to train the students in my laboratory. The students learn how to use database searches to discover the relevant literature.*
- D. Train students how to read literature. Let's face it, reading peer-reviewed literature is daunting until you learn how to do it. Strategies from other, more experienced students are helpful for new students.*
- E. Citation management training. All students who engage in manuscript preparation are required to learn the citation management software that I use for my research. If you are not presently using citation software, you may not understand how timesaving this software can be for busy academic faculty – you should make this a priority.*
- F. Development of study hypotheses. My research is primarily hypothesis-based inquiry, therefore, I spend time on the importance of framing the literature review, methods, and a priori data analyses according to the hypotheses that drive the research effort.*
- G. Institutional Review Board material preparation. This process drives home the importance of ethical research practice.*
- H. Training data collection methods. While waiting for the IRB to be approved, I encourage the students to practice the data collection procedures with each other for more professional data collection practices with volunteers.*

Students can then engage in data collection and analyses as they are able. I have found that if an undergraduate student can commit at least 4 full semesters to my laboratory, they are likely to earn co-authorship on a manuscript if they have the following characteristics: initiative, perseverance, self-reflection, excellent time management, and intellectual curiosity. Students understand from our first meeting that their level of participation and the deliverables they realize from research participation is driven by their own initiative. Students are expected to schedule and follow through on all of the ethics, literature search, and citation software training that I require for the laboratory. I have found over many years of mentoring students that they are often energized by high expectations. In this beautiful time of young adult development, the responsibilities asked of these student researchers help cultivate professionalism, maturity, insight, and pride in what is accomplished. Expect a lot and most won't let you down. Smart students love a challenge.

F2: As an early career investigator working with undergraduates has been a vital part of progressing many research projects. Undergraduate students bring an infectious energy to the lab since they are eager to learn and assist. The research community created in our lab cultivates an atmosphere of growth for both the mentor and mentee. New ideas are generated through the social exchanges that occur in and outside of the lab. These ongoing discussions help to refine ideas and spark new ideas as undergraduate students explore their curiosities. Learning to scaffold tasks within experiments has been key for providing experiences that are based on the students' interests and desired outcomes.

I typically meet interested students after they have heard about the research activities occurring in my lab during the class taught by my more senior colleague and co-author. I will receive an email or have a student drop by my office shortly after she discusses the research projects that are being conducted in our department. I then have an opportunity to engage the student in a dialog about their research interests and what makes them curious about working in a lab. I describe the ongoing projects in more detail and observe which projects they want to spend more time discussing. Once their research interest is identified and they express a desire to start working in the lab, they begin the onboarding process of completing the research compliance training. This is their first test of meeting deadlines. They are told that it must be completed in a week and they cannot begin working in the lab until it is completed. Once they have completed the training, they are partnered with a graduate student or more a more senior undergraduate student who has already been working in the lab. The partnering is intentional for building lab camaraderie and to provide a safe space for asking questions. My graduate research assistant who also serves as the lab manager begins training on the lab protocols located in our tailored lab manual. The student is introduced to the team members working on the research project to which they are being assigned. We have scheduled weekly meetings for lab debriefings and planning. We utilize Microsoft Planner to assign and track the project task. The lab manager is responsible for keeping the tasks updated. The project manager software sends each team member e-mail notices and reminders about task deadlines. The utility of using a centralized project manager is that it provides accountability across the team to meet deadlines and the expectations are clearly specified. I also routinely meet with students individually to discuss progress, challenges, and needs.

Students are encouraged to advance projects to local, regional, and national presentations. Undergraduate and graduate students utilize the paper template to formulate drafts for posters, presentations, and manuscripts. Students feel a sense of accomplishment and reward when able to present projects. Students work together to produce the final written product and coach each other as they prepare for presentations. The team-based approach builds a community of practice where we co-share the responsibilities of advancing the research projects. This approach also helps to support my ability to manage the multiple mentoring relationships simultaneously.

*Another intentional builder of relationships between myself and the students comes from Stephen Covey's 7 Habits of Highly Effective People-Habit #7 "Sharpen the Saw". A fun activity builds the three Rs into the culture of the lab: **reward**, **renewal**, and **relationship** outside of the lab. Students have an opportunity to interact with me in a more casual environment and grow deeper friendships with lab mates. These times are critical to our ongoing productivity and give us opportunities to problem solve in a less structured environment as well as build strong relationships. The encouragement of these relationships provides joys that balance the challenges of tenure pursuit.*

I have adopted aspects of both the apprenticeship model and hierarchical model to manage the time constraints of mentoring multiple students while advancing my research while on tenure track. The building of relationships is key to flaming the fire of curiosity and maintaining a positive lab environment. The students and I develop bonds through the research experience that create efficiencies and make the times of tedious work enjoyable. Students also begin to take ownership of their lab and an environment of belonging is cultivated. This sense of belonging has additional benefits for under-represented students that may have unique fears and entanglements with imposter syndrome that may deter them from pursuing research. In creating a safe space for the exchange of ideas and even confusions, the opportunity to build the self-efficacy and confidence needed to pursue a research career are fostered. The reward is when you see the students grow and share how they will continue to pursue research. I have seen students transform from being uncertain about research to being certain that they will pursue a Ph.D.