Narrative: Perspective on being a successful mentor and fostering a culture of scholarship
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I do not have the top ten tips to being a successful undergraduate mentor. As someone who believes only in theory and proofs, I am acutely aware that my stories of successfully mentoring undergraduates, as you can see from the detailed list of the accomplishments of these students provided in this application, may not be generally applicable. Success often depends on an intricate dynamic between mentor and student. However, I will share with you what motivates and drives my mentoring philosophy, and the practices I exercise at Mason to foster a culture of research and scholarship among our undergraduates.

I have been mentoring undergraduate students since I was a graduate student back at Rice University. While at the time I felt mildly inconvenienced to add training and mentoring to my list of research projects, I felt at the end of that experience that I had found my calling. I absolutely loved taking something complex that was the result of decades of research and scholarship and explaining it intuitively to undergraduates with little technical background. I felt responsible when they did not find something as exciting as I did, which often motivated me to find new ways to make material tangible and motivating. The experience convinced me I loved teaching and mentoring, and that I felt truly fulfilled when I could convey my research to others and convince them to join in on my quest for knowledge and understanding. I also discovered that I loved building people up, helping them shape a vision for their future, and sticking with them till they were on a solid footing to achieve it on their own.

Armed with passion as an assistant professor at Mason, I immediately proceeded to recruit undergraduates in my research army, as I jokingly call students in my lab. Right as I got started in August 2008, I designed and proposed CS444 - “Introduction to Computational Biology,” a course that seamlessly incorporates research and some of my very own software into the curriculum. In addition, I volunteered for numerous guest lectures highlighting research in my lab anywhere I could, including introductory courses, such as CS101, and seminar series geared to undergraduates, such as ACE scholars. I also promptly started meeting with women undergraduates in the department, reviving CSisters and becoming a faculty mentor the organization, and setup the process to welcome women undergraduates of other universities in my lab over summers through the CRA-W DREU program. I scoured resources at Mason for under-represented undergraduate students and even high-school students, contacted local high schools, and made sure to add specific sections to my grant proposals and budgets for college and pre-college research and scholarship.

These efforts have paid off. In the course of 5 years as an assistant professor in the department of Computer Science here at George Mason University, I have attracted and involved in my lab's research more than 10 undergraduate students. These are students who have a record of accomplishments, whether that is a poster, a software tool, or even journal and conference papers. What this number does not tell is the undergraduates who have come through my door asking for resources outside of Mason and help with applications for summer research in other institutions, often closer to home. What this number also does not show is that I am not single-mindedly focused on my lab and my research. Instead, I believe that we as a department become stronger when all our undergraduates have the opportunity, the resources, and the support that they need to enhance their educational career with research opportunities, be they in my lab, in my department, at Mason, or elsewhere. Since I am a regular participant and contributor to the Grace Hopper Conference Celebration of Women in Computing, the National Council of Undergraduate Research, the Computing Research Association (CRA), and the CRA-W DREU program, I dedicate time each Fall semester to gather a list of active REUs from the National Science Foundation page of awards and direct solicitations by faculty and the above organizations. I have started a practice with our secretary in charge of undergraduates in my lab over summers through the CRA-W DREU program. I scoured resources at Mason for under-represented undergraduate students and even high-school students, contacted local high schools, and made sure to add specific sections to my grant proposals and budgets for college and pre-college research and scholarship.

In addition to these efforts, I have shaped all my undergraduate classes to have research incorporated in every subject topic. I do not teach by simply reiterating facts, formulas, algorithms, or proofs. Instead, I start every lecture with a complex research problem with a societal and often health application. This gets students to thinking, and then in the context of what we need to address the problem at hand I proceed to sharing with them knowledge that has been accumulated and passed on to us from researchers and scholars through the years. I also make an intentional point on spending time to provide some background into the researcher accredited with an idea and his/her progression of thought. I often tell my students that it serves us well to humanize our scientific leaders, so we can see ourselves in them.

Let me also add something on mentor-student dynamics. I am very much aware, after reading many educational research articles, of the struggle to include more women undergraduates in our department and even research. I make a point to solicit women, in part because they are under-represented and often feel intimidated in a male-dominated environment. I have also noticed that, while these students are often very thoughtful and end up being very successful in my lab, most of them need to build up their confidence. Often, the support I provide to these students goes beyond research and academic advice. There is a personal component, as well, where I find myself sharing with them where I came from, what I struggled through, and how I ended up where I am. Once they find their confidence, they are on their way to great accomplishments.

My hope is that one day all the undergraduate students I have touched and affected will look back and say that they envisioned themselves as leaders all along, and that the interleaving of education and research at Mason sparked their great adventure and set them well-equipped in their journey. This is my mentoring philosophy in a nutshell; provide opportunities, skills, and the support that students need to envision themselves as the leaders of tomorrow. Once they do that, there is no nothing hindering their progress and confidence that they can be scholars and researchers.