

9/15/09

Dr. Robert Goldberg, instructor of my Genetic Engineering class during my sophomore year, urged us to ask questions, formulate hypotheses, put forth ideas, and think critically; everything a physician must do everyday and precisely what I love about science. During Dr. Goldberg's subsequent Gene Discovery Lab class, I recall taking my first gel electrophoresis photo and being giddy and anxious to see the results of my hard work. From interpreting unexpected results to perfecting techniques in molecular biology, I learned patience and determination and developed valuable problem-solving skills.

Now, as a Teaching Fellow for these very same genetic engineering courses and as an undergraduate research assistant in his lab, I have gained another set of skills that I believe will even transfer to my future ambitions in the field of medicine. My responsibilities as a teaching fellow include leading discussion sections, giving lectures on major concepts and lab techniques, and guiding and mentoring students in the lab as they carry out their own experiments in which they analyze specific genes and the roles of these genes in seed development of Arabidopsis. While research has taught me how to think critically and creatively, teaching has taught me how to communicate more effectively. I have learned the importance of being articulate and connecting with people on a personal level, whether it's leading a class discussion or meeting with students individually.

My experiences in the Goldberg Lab have taught me many invaluable lessons about myself and have greatly impacted the way I think about science. Dr. Goldberg urged me to teach my students in the Socratic method by constantly asking questions, which helped me to always think creatively, rationally and on my feet. Teaching has also improved the way I think in terms of helping me to think in a more conceptual manner. I also learned that I take pleasure in teaching others, which I believe will be important in my career as a physician since it is a doctor's responsibility to not only treat patients, but educate the community. My experiences have also reinforced why I love and respect science and research. I admire the creativity, dedication, curiosity, patience and hard work that all of the researchers in the lab radiate everyday and I have even begun to see it within myself. I have also learned that a career in science is very demanding, but also undoubtedly rewarding.

Sincerely,

Kristin Gill

6/4/03

I would first like to express my extreme gratitude for being given the opportunity to be a part of a unique and truly wonderful *experience*. For ten weeks as a Teaching Fellow, I was a member of a rich intellectual circle that included an outstanding professor and mentor, 40 gifted and motivated students, and engaging colleague.

Students from diverse educational backgrounds and limited science background learned the scientific and applications fundamentals of genetic engineering. Indeed I was impressed with the level of comprehension and academic growth that the students displayed throughout the quarter. Each week during our seminars the students came prepared and ready to learn, this atmosphere was created by the teaching technique employed—the Socratic Method, my ability to create a comfortable environment, and excellent material in which to spring board discussions. Professor Goldberg skillfully selected material that had equal parts scientific merit and socio-political relevance. The students were engaged at step of the way, and interacted effectively with each other, the professor and the teaching fellows. At the end of the quarter each student was capable of working in a research laboratory.

Professor Goldberg provided the framework for course. His philosophy of “teaching people how to teach” creates an educational climate that facilitates the exchange of ideas as well as a wealth of experience. His skill in guiding us to proficiency using the Socratic Method prepared for our weekly seminar sessions. This allowed us to create an intellectual climate unique for an undergraduate course. This method however requires organization, patience, and preparation. Professor Goldberg showed us, by both verbal encouragement and by example, to maximize our time such that we optimize our teaching output. As the quarter progressed we, Mike and myself, soon realized that these are some of the critical qualities need to fully reach our academic potential.

My abilities as a teacher grow exponentially throughout the quarter. Before this quarter my teaching experiences were confined to strictly science students, who for the

most part had taken all of the pre-requisite courses and had a basic understanding of science and the scientific method. This course was a challenge for as many of the students were social sciences and humanities majors. I knew that I needed to prepare well, remember to be extremely patient, and create an atmosphere where the students felt comfortable asking questions to the class and answering those questions. It is my personal belief that in order for my students to have to best educational experience they need to have a level of confidence that comes from being in a positive environment, where you best is asked of you. The students saw the level of effort and energy that I brought forth and gave me more than anyone could ever expect in return. We became a close knit group of scholars and friends. Although there were times when I was frustrated, I knew that I could always seek the advice of Professor Goldberg. I can honestly say that I received nothing but positive and constructive criticism.

There we many times where I felt that I got more out of the course that the students. I consider myself lucky. This experience has given me a strong advantage over 90% of my peers. The lessons that I learned from Professor Goldberg will last a lifetime.

Thank You,

Malik Joseph Francis

6/6/2003

The experience I have had with Dr. Goldberg over the past two quarters cannot be summed up in a hackneyed phrase or saying. Dr. Goldberg has affected my life in too profound a manner for this to be possible by awakening and developing within myself a deep love of teaching. Dr. Goldberg has passed to me some of his immeasurable talents for exciting students to the joys of learning and performing science. I have witnessed first hand the growth of student's knowledge and more importantly their thought processes under Dr. Goldberg's unique approach to scientific education. Dr. Goldberg stresses in his classes the importance of original thought and creative thinking in science, which many students had not realized was part of the scientific process until taking his class. Dr. Goldberg accomplishes this by challenging students to think of the experimental basis of scientific knowledge rather than having students perform a dull memorization of facts. While this approach is more difficult and time consuming for both student and instructor, it is also more rewarding and creates a unique educational experience that often changes the course of a student's academic career.

One of the most important events of my academic career has been Dr. Goldberg's sharing with me his techniques for creating an exciting, vibrant educational atmosphere which has been so successful for him. While a teaching assistant for Dr. Goldberg I was responsible for conducting a seminar session each week where I would guide the students through Scientific American articles concerning historically important experiments. Dr. Goldberg always stressed to focus on the big picture when it came to teaching, to concentrate on the elegance of the experimental design rather than the minutiae of the system. One such article I presented was the original Scientific American on molecular cloning written by Stanley Cohen in the mid-1970s. Part of the brilliance of this article was Cohen's synthesis of the cloning method from various, seemingly disparate practices of the time, showing true creative ingenuity. Instead of teaching my students the simple requirements one must have for cloning, such as restriction enzymes, plasmids etc., I asked them to go back to the 1970's and talk about (using their knowledge from the article) what was known about each of these fields and how *they* could put all of them together to create a novel, revolutionary idea. This approach succeeded because it introduced my students to the creative aspects of science, which is lost when only factual scientific knowledge is presented.

In addition to my experience of teaching science in the classroom I have also been privileged with the opportunity to teach undergraduates in the laboratory. After the first quarter lecture class several students were accepted to begin working in our lab. This experience, while different from the previous quarters seminars, was no less rewarding. I thoroughly enjoy helping students on a one on one basis and I was able to teach them many of the laboratory techniques I have learned during my time in the lab. The laboratory experience allowed students to gain a greater appreciation for the arduous, time consuming work that science requires. While the hours were long and the work difficult, the students were able to experience the joy of having experiments work and discovering things no one had ever seen before. Indeed many students, who had remained skeptical about laboratory work, found the excitement of obtaining results so infectious that they are now considering careers in science. One of my proudest accomplishments with the laboratory work was the sense of community that was fostered

during the quarter. I came to know the students very well and shared in their trials as their experiments failed and their exuberance when they worked.

The lessons I have learned from Dr. Goldberg have been invaluable and I am truly in his debt. Dr. Goldberg has taught me that anything one does should be done with one hundred percent dedication and commitment, and this is the approach he has shown me to take with education. While some professors spend more time on research than teaching, Dr. Goldberg does not compromise on either, and in fact uses each to enhance the other. This creates a unique experience for those around him, which I feel very fortunate to have participated in. From my experiences teaching with Dr. Goldberg I now wish to continue teaching in the future and I am seriously considering an academic career.

Sincerely

Michael Ferry