

Statement of Teaching Philosophy – Juliet Hahn

Philosophy Most beginning chemistry courses teach students the rules of chemistry in a rather dry, boring and unfriendly way. I became a chemist because I think that chemistry is fun, challenging and exciting and I want to show my students how this seemingly dry stuff is actually fun and interesting to me. Students who are engaged and interested are better motivated and learn better than those who are bored, disinterested and absent. The most important qualities of a teacher are a real love of the subject (because if your subject isn't interesting to you, it is really hard to make it interesting to anyone else), empathy, and an open mind (because you need to function as the human bridge between the material and the students).

How to improve student performance: Many chemistry students come into class expecting to do badly. I tell my students that if they come in expecting to flunk chemistry, then they absolutely will flunk. However if they come to the class with the attitude that if they work really hard, then anything is possible then anything is indeed possible. My general philosophy about teaching chemistry is to explain things in a way that the abstract and dry concepts seem common sense, easy and (gasp) fun. For instance anti addition of halogens to alkenes is described as Arnold Schwarzenegger (the halogen) sitting in a child's chair (the alkene). It is hard to forget the gigantic halogen sitting on the tiny alkene resulting in the second halogen anti addition during an exam.

Not keeping up is the reason why most students don't do well in Organic (& General) Chemistry. I make my students constantly study by giving quizzes between their exams. I also emphasize understanding the material rather than having students memorize everything in sight because this is what they will leave the class with rather than the 200 equations that they crammed. Every one of my Organic Chemistry exams has a "thought" question which tests understanding rather than memorization. Although of course a certain amount of memorization is essential in learning organic chemistry.

My students also know that their grade is exactly what they produce on the exams and they know that they can believe in the integrity of their grades. To ensure this, students receive a copy of the answer key that I use to grade their exams with points listed for common mistakes. The answer keys also help the students learn from their mistakes on quizzes and exams. (My Organic exams consist of 1/3 multiple choice, 1/3 short answer and 1/3 essay-mechanism-synthesis.)

One semester for some reason, my students started flunking out every quiz and it was obvious to me that if I didn't do something the majority of my class would flunk the upcoming exam. Instead of throwing up my hands and saying "... well those people are just too stupid to learn this stuff...", and either making the quizzes easier or flunking out the majority of the class, I made a deal with the students to give a quiz every week so that the students would study more and promised to drop some of their terrible quiz grades. As a result the students learned the material and not very many students flunked the class. Of course both the students and I had to work very hard to achieve this result. The students had to feel like **they** had leveraged a deal with me. The students also had to own the solution for this approach to work because if the students don't try, no amount of extra quizzes would have helped. Helping students really perform at their very best is always challenging.

Sometimes in these large introductory lectures, students can feel like a number in the crowd. I believe even in a lecture of 50 students that there are ways to make the students feel as if they and I are real human beings. I can tell even in a class as large as 200 students if I see the gleam of understanding in the eyes of the individuals in the entire class with one glance. Also I ask for and answer questions during class even in large classes. I also actually listen to my students and sometimes I change the way I do things if I think that the students have a good idea. I feel like I am teaching chemistry to 50 of my friends and I almost cannot believe that I am getting paid to do something that I enjoy so much.

How to use research with students to recruit students and solve the retention problem: One of the side effects of undergraduate student research is that the students get paid to do research which actually is more important than many faculty may think. I never realized the effect of money until I talked to this one student. The student, one of my academic advisees, was not doing well and was on academic probation

and had to come meet with me before signing up for classes. I thought initially that the student was just a lazy, bum lacking initiative because he completely missed one appointment and came late to his 2nd appointment. When I talked to him, I realized that he had come late to his appointment because he had worked all night. His grades had more to do with him falling asleep in class because he was working too hard than his intelligence, initiative or willingness to work.

When students get paid to do research, students work on campus with a very flexible job schedule which is a formula for success and a recruitment tool for the university. Students also get additional reinforcement for studying because there is the camaraderie of the research lab group colleagues and research advisor. Part of the reason why I want my research students to feel as if they have come home when they come to my research lab is to make the students feel as if they really “belong” to the university or even as if they own a small part of the university. Research assistant jobs for students (even non science major students) can be a recruitment tool for the students to transition into well paying science and technology jobs of the future.

How to help students get good jobs: For higher level courses the curriculum should make the chemistry graduate a hot commodity on the job market by reflecting current trends. In addition the curriculum should prepare the students with a solid background and make the students into independent thinkers. Independent thinkers always do well in anything that they do. To reflect current trends, the Chemistry curriculum should emphasize applications in nanoscience, pharmaceuticals, polymers, and green & alternative energy. In my graduate level courses, I have covered recent research papers in addition to the textbook in order to emphasize current developments. Industrial involvement in funding of academic research and on site industrial recruitment of new graduates should be actively pursued.

Why I am a professor: I think that being a professor is a rewarding profession because you get to influence the most important thing in the world, the minds of young people and you get to shape what the next generation will be doing with their lives. I think that students know when a professor is trying to exploit them and when a professor is truly trying to help them and sometimes just that fact makes all the difference to the student's success. I am also really good at teaching students and I am really good at Chemistry Research. In order to succeed in the end, one should always do what the person is really good at doing and one should not give up because of a few obstacles.

Qualifications: I am qualified to teach Organic Chemistry and Advanced Organic. I am also qualified to teach General Chemistry for major/nonmajors. **[Organic and General Chemistry classes make up 100% of most university science requirement for majors and nonmajors. All students who decide that chemistry is not for them make this decision based on their experience in these two classes. I can change that!]** Two of my current research projects are DNA projects and I have a long history in Bio-Organic / Bio-Inorganic Chemistry research so I am qualified to teach a Bio-Organic/Bio-Inorganic course. Also I am qualified to teach an upper level class in Spectroscopy for Organic & Organometallic Analysis & a Stereoselectivity Synthesis course.

Student Research: As a professor teaching Organic Lab & as a Principal Investigator (PI) with research students, I have had a lot of experience working with inexperienced chemists. I have had as a PI 2 to 8 mostly undergraduate student per year working on my research projects. I usually work side by side with my research students in the research lab so that it does not take much time for me to correct student research technique mistakes and the students learn a lot in a short period of time. From directing research a number of years, I have learned how to have my inexperienced research students contribute to my research output instead of lessening my research output by only taking up all of my time. My research students will tell you that I am a research group member and friend more than I am the boss.