

Introduction to Critical Feminist Studies

Paper #3

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Rethinking the Haverford College Chemistry Department:
Curriculum and Teaching Methods

About the Author: This is written from the perspective of a professional student. Right now, that is what I consider myself. I pay for the privilege to be at college, enough to make college my main priority. This is not written from the perspective of a future professional teacher. I will always teach, just as I will always learn, but I do not have plans to become a professor or to in any way teach a class as my career. This curriculum is from a student, for students, and for the future that these students will determine. More than a curriculum, it is a set of changes that should be made to the department philosophy and to specific classes.

I started working on this writing assignment with the intention to re-design a high school curriculum. Upon further reflection, I decided to focus on my future “home” department, the chemistry department at Haverford College. Even to me, almost finished with my class labeled feminist, it seems radical or strange to consider the major fulfillment requirements of a science as feminist or not. Feminism is political, and science certainly has politics threaded in it, yet somehow science education doesn’t seem as political.

Chemistry in particular is usually genderless, engaging in the study of atoms not people, making it hard to approach from a more tradition Western feminism

(equal rights for men and women). Institutions of chemistry, journals, and labs can all be influenced by gender, but less so for the subject itself. The feminism discussed most in class is what I describe as “equality for all”. Personally, I think this belief should get a different name and not be included under feminism particularly. For redesigning the chemistry department requirements, however, I decided that it is the definition of feminism that could greatest influence the redesign.

This is the type of feminism that McIntosh seems to ascribe to in her talk “Interactive Phases of Curricular Re-Vision: A Feminist Perspective,” which I used as the starting point for my curriculum redesign. In this talk, McIntosh describes five phases as curriculum development, from education focused on great men and authority, to a focus on inclusive definitions of success and student authority in learning.

She does not talk about chemistry in the talk, nor physics or math. There are sections about biology, which is easier to apply to the human body and race than chemistry or physics is. This is where my revision steps in. While most of McIntosh’s ideas about teaching of historical social structures are not applicable to chemistry education, her goal of removing authority is. Perhaps classes can be picked to give the students more authority.

The current chemistry major requirements include three to four semesters of “basic” chemistry (general and organic), one semester of physical chemistry, two semesters of physics or biology, two semesters of laboratory courses, one semester of inorganic chemistry, one semester of an elective, and the senior seminar.¹

¹ <http://www.haverford.edu/chemistry/curriculum/InfoProspMajors.pdf>

Should the chemistry department require a social science or humanities course that focuses on marginalized groups of people who worked on chemistry? No, because a chemistry major should not spend a lot of time thinking about who made important discoveries. Chemistry studies things and materials, not people. These names should be in textbooks, but not on tests and not focused upon. Unfortunately, this does mean that most of the names will be of white males, due to historical discrimination against any other group in chemistry. The college should make up for this discrepancy by hiring a diverse faculty that includes previously discriminated against groups. If admissions does its job, then the students will not fit the white-male-only demographic seen in the texts, and students can see themselves in the faculty.

Learning chemistry is sometimes like learning a language. For this reason, there are difficulties in giving the students authority. You cannot put new students in a room and ask them to start teaching you French if they've never heard it before. New chemistry students in general chemistry need to be taught how to balance reactions, read the periodic table, use chemical units, and other basic skills chemists need to communicate with one another. The laboratory portion of the course is an opportunity to give the students agency. Instead of only having a set procedure to do each lab day, students should be taught a basic technique at the beginning of each lab day, and then given a question. In small groups with guidance from teaching assistants and professor if needed, the students can answer with experimentation. There is some sort of attempt to do this in the current general chemistry course, but

it is shallow, consisting of a worksheet with comprehensive questions (students don't have authority, but are possibly challenging the material).

The creative lab approach should be used in organic chemistry (traditionally a sophomore course) as well. Smaller classes could also help make organic chemistry more feminist by making it easier for more students to speak. It would not be—and should not be—a discussion based class in the same way that a social science or a humanities class can be; there is just less up to interpretation in a college-level chemistry course than in a non-science course. Feminist teaching would mean trying to engage the students and instill confidence in them.

Higher-level courses should also lean towards the seminar type. As a way of social change, seminars teach students that they have power by requiring student participation for the class to work. Higher-level courses should rely on a combination of journal articles and textbooks to encourage thinking beyond the authority of the textbook. Journals are another type of authority, but a more democratic one than textbooks because more people write and edit them.

In order to learn about different cultures, the chemistry department should make it easier to study abroad by moving one of the higher-level courses to the sophomore level, and making the lab course non-cumulative. This would allow students to go abroad without taking the laboratory course second semester senior year, when they are working on their thesis.

As part of the major requirements, two or three semesters (depending on department funding) of research should be required. This makes everything learned in courses more personal, as it makes a student's studies their very own work.

After these curricular recommendations, I still wonder to what extent feminism applies to chemistry undergraduate course design and selection. At the college level, what students learn in a chemistry class is what the field already knows, and what is not changing for the most part. Humanities rely more on skill building than fact-learning. In the humanities and social sciences, there is also more than one answer to questions, even at the introductory level. In the natural sciences, students don't encounter unanswered questions until later in their training, perhaps not until graduate school.