**Teaching Philosophy Statement** Gareth Edel

I approach teaching through emphasis on skill building and expanding in students a critical intellectual appreciation of complexity and perspective. I consider the teaching of critical thinking and literacy skills of utmost import to making education useful for students moving into professional or academic pursuits, as well as expanding roles as participants in civil society. While memorization or the inculcation of very specific disciplinary information in testing can be neccesary, I emphasize development of theoretically informed perspectives as a base for future formal or self directed learning. In learning for participation in specific intellectual domains and conversations, as in graduate education, information is useful, but the ability to appreciate and select between an ever growing availability of information demands interpretation and selection.

 In my teaching experience, discussed later in this essay, I practiced an emphasis on skill building drawing on my own experiences learning to be a critical thinker, through specific classroom experiences as well as encouragement to draw on the breadth of life experience. I learned from my most successful teachers that allowing students the space to draw in their experiences grants authority and applicability to what might seem distant subjects, and that the importance of a theory in abstraction is likely less formative than the connection of theory to a comprehensible or experientially vital example.

In my junior year of high school I had the opportunity to take an elective called, simply, science seminar, in which each week students researched and presented a topic of their choice in any scientific or technical domain. Each week we were responsible to survey, as best we could, the subject and to apply several concepts, first among them a critical disloyalty. In my graduate study of science and technology studies we engage with the ideals of the scientific community, their historical origin and their realities. But this disloyalty, among all ideals, seems worth protecting in the form of being critical of our own beliefs and evidence. The scientist should appreciate truth more than they are attached to the object of their study or their own products. In this course the subjects of research were selected by student interests, but despite of, or perhaps because of this personal interest we were to challenge the object of study. The subjects and the research materials were to be considered skeptically, to always contain cost as well as benefit, that knowledges and functions of technologies are partial, and that the process of development is important.

Each week as teenagers we chose hot topics of the day, like Virtual reality, chaos theory, genetic engineering, video games or the recently popularizing internet, and were forced to come up with both sides of a debate about it. Were these things useful, truthful, cost effective, appropriate, and above all were our ideas about them as we started the research accurate to the reality we found. The teacher asked us to guide our choices and analysis with three simple dictums:

1. The core of the scientific approach is to critically engage with the subject and to examine evidence on both sides, that is, in order to learn we have to be willing to evaluate both sides of even those topics we hold dear.
2. Normally unquestioned subjects such as scientific knowledge and technologies were not to be considered divorced from their applications, and origin.
3. Reflexivity, the realistic evaluations of our own ability to research and articulate findings, as well as appreciation of how partial our knowledge may be.

We were reminded of these ideas in part by visits to science labs at nearby New York University, and a trip to Cold Spring Harbor. For the students in that class in 1994 being the first people we knew to have email addresses, despite few targets to send emails to, was an exciting reminder of the live presence of these issues in the real world. We combined the communicative and research potentials of the new information technologies with a series of lessons on research practices. That class still represents a near ideal educational experience for me. The course was designed to teach us to be able to learn on our own, to be critical thinkers, and we were allowed, or even required to participate actively in our education. We were presented with experiential moments walking through and seeing demonstrations in science labs, and were forced (in my case against my will) to learn and adopt new technologies, while being treated with a level of intellectual respect that I don’t think is easy for professors to replicate in relationships with students. I didn’t realize at the time how unusual it was to have weekly research, presentations and writing assignments, and the sheer volume of practice that year represented. I believe that experience helped me develop critical thinking skills and offered a model for continuing my own education and the teaching of others. The concepts of critical inquiry are disloyalty, and can be hard as they require students to challenge beliefs. Critical thinking and literacy teaches the skill of seeing our loyalties and those of others, of gaining tools for the difficulty of evaluating and interpreting evidence, and it serves as the core of my approach to the educational process.

I have since had the experience of being the teaching assistant for a wide variety of classes, starting during my undergraduate education, and continuing in a more active role as a graduate student and I am still guided by the mechanisms of that class. This attempt to foster critical inquiry through reference to scientific ideals of practiced was challenged while I was a teaching assistant at Hampshire College as an undergraduate. My initial experience was serving as assistant for Lynn Miller, professor of genetics teaching ‘Ever Since Darwin’ an introductory course on the history and construction of evolutionary theory, as well an introduction to natural history and systems biology focused on parasites, in which students were eager to hear how better to be a scientist. Following these experiences, as I moved to the study of the social studies of science and medicine, I attempted to articulate critical thinking as science in two courses outside the sciences, the first on the anthropology of reproduction and gender, and a second on ethical dilemmas and practices for biological anthropology students, both classes with students who identified far more with the humanities. Introductory level students in the sciences immediately accepted the idea that critical analysis, extended even to consideration of historical and social dimensions, despite difficulty in applying these ideas it was an easy sell. In contrast, my peers senior students in the social sciences argued from positions of extreme relativism, distrust of my scientizing, or a belief in their established skills. This experience led me to be much more careful about the integration of critical thinking in assisting with courses for my mother after college. While working in medical advertising my mother’s illness required me to take on a significant role as a guest lecturer and assistant for her teaching of courses in the department of urban studies of Queens College, CUNY. There I lectured and directed conversations in introductory courses on “poverty and affluence”, “women in the city” regarding the social construction of gender, gentrification and urban development, technological infrastructure, and the history of popular and medical concepts of race and racism. Within this group of students with more cosmopolitan experience of the city I found the linking of personal experiences of students particularly effective as students had diverse experientially grounded perspectives on these phenomena. Tapering conversation to encourage student participation while providing theoretical lenses that suggested the partiality of perspective worked well, and the later references to ideas I introduced, such as social capital, and structural power or the enculturation of values and ‘common sense’, followed from one conversation to the next amid the larger conversations in the course.

In light of these experiences I was surprised in arriving at Rensselaer Polytechnic Institute (RPI) for graduate study to find some students not only resistant to political frames, but to the notion of critical thinking itself. At RPI I taught very different courses to largely technically minded lower division undergraduates. Because I was able to ground the concepts in the shared experiences of working with information technology (IT) the two semesters as teaching assistant for a required course in the IT major were comparatively easy. Even resistant students asked in the course to critically engage with topics like ethnicity, situated/appropriate design, the shaping of options and politics by technologies, managed to understand their relevance to design process and professional work. While their lack of social science training slowed the process, I was often able to encourage their understandings through the professor’s use of a role playing/simulation model of business development throughout the semester. In connecting their growing familiarity with professional tasks to the idea of complexity and perspective they often gained insight and began to think critically on their own. In contrast while assistant teaching an “introduction to science and technology studies” to a group of mixed undergraduate engineers the prospect of complexity was challenging. While the professor was able to show the dangers of unintended consequences and the inclusion of social realities into knowledge and technology, the students maintained a sense of the exceptional to these cases. In my sections, I found that it was only through the false promise of theoretical certainty that they would begin critical thinking about their own future design projects. I asked one who was particularly dismissive of the film “Who killed the electric car” (2006) why he considered it inapplicable to his future work as a nuclear engineer. He pointed out that the federal regulation of nuclear materials precluded the sort of economic interests we saw in the film, and for a moment I was stymied. Then out of desperation I asked him to explain the design and maintenance failures of the Chernobyl reactor and Three mile island nuclear power plants. His pause was gratifying, and over the course of the next hour I asked students to go online and find cases of disaster related to their field of engineering. We read and discussed the contingencies and roles of engineers in these cases, and it was a turning point as students became interested in seeing the course material as tools for the prevention of future disasters. The freedom to do this within the course framework, already focused on the development of critical inquiry allowed the students this epiphany as course concepts like “technological somnambulism”, appropriate design, and the construction of implicated actors became real for them.

 I have been fortunate to work under professors who were committed to development of communications and research skills, as well as mastery of course material, and consider that a key mark of undergraduate education. This is less true of potential teaching in a graduate program in which the emphasis has to be on a much higher level of interaction with the material. In attempting to recreate that experience in some degree in my own teaching, I’ve had two key obvious insights, that the professors I have worked under, or in my role as assistant I, am absolutely required to present a clear framing to undergraduates. This framing is not because they are incapable of gaining information from reading, but rather their unfamiliarity with social sciences or theory in general makes it difficult for them to gauge readings as offering perspectives. The central part of my job in teaching may depend on the students, but it is generally to connect the readings together, to expose the generalizability and to help them draw out key ideas from among information. Learning is often more about making connections between information and ideas than it is about remembering every idea. Learning is as much about building a repertoire of relationships and patterns that can act in future learning as it is about being knowledgable in the colloquial sense. This is a lesson taught us by technological data management and mathematics as well as my own experience. In my earli

Questionable as it may be to describe teaching this way, your job is to get the students to understand the importance of what you have to say, while giving them the vocabulary and skills needed to understand it and evaluate for themselves. An absolutely vital part of science and technology studies as a discipline is to embrace the importance of complexity. The problem is complexity is one of the most frightening or at least difficult things for many of the students I have had the opportunity to teach. Within American culture and politics the sound bite, and straightforward seem to have taken root, which often presents a source of confusion to students who have been taught using monolithic and simplistic forms of knowledge throughout much of their education. If the social sciences, as well as general critical thinking training, are to take hold of students and have impact it will be through the inculcation of an appreciation for complexity. I don’t demand agreement in the classroom, but I ask that students learn to articulate multiple reasons and situate ideas among other ideas.

I primarily respond here with an approach tapered to the specifics of undergraduate teaching, while inherently true of my potential approach to graduate teaching, this skill building approach will be ‘zoomed-in’ the broad societal and theoretical issues at hand are replaced by depth of reading, critical engagement with and trained recall of detailed specifics. The nature of graduate education demands that students form mastery of specific domains as well as broadly applicable skills, and that is not represented as well in this articulation of my approach, or experience to this point. Similarly, upper division undergraduates are required to gain greater mastery of the details of the course material as well as improved skills to a greater extent than in lower division courses. A potential transition from introductory skill building to a more compound expertise comes from focus on research design, consideration of the design in the materials read, and the ways and values of theoretical and methodological frames for potential research of the student. I require that students use critical eye on diverse academic work that forms the body of disciplinary knowledge, and use the necesary detailed analysis of the arguments and theories in relation to methods and evidence in the work to construct a mastery focused on engagement rather than repetition. Complexity should not simply be a slogan, simple practices can contain and communicates larger ideas, and I think the idea of critical inquiry has to be embedded in the classroom. Below are listed some simple lessons I have found useful in doing so.

* When in doubt, have someone else say it, films or guest lectures are great, they remind students that the faculty member isn’t alone.
* Transparency and contextualization of materials is important. At some point discussing critical literacy, modes and practices of expertise, looking at myself, the speaker or the film maker themselves as part of the lesson is useful.
* Frame issues as debates and make students participate, hearing and considering both sides. The impulse to present convincing one sided lectures, to indoctrinate, is valid over time but needs to be tempered if you are to maintain trust and instill critical thinking.
* Increasingly short spans of social memory can be relied on and as a result updating examples and making connections to the current life-world of the students is important. This is not simply the drawing together of current cases and examples, but it is about repeatedly demonstrating the relevancy for the future. In general students can be taught the importance of the past better in reference to the future.
* Reflexivity is important but dangerous, because you are breaking out of expressions of authority that are powerful for the students.
* Testing with short answers is better than multiple choice, but essays and directed writing (even brief) provide experience with articulation and connecting ideas better. To enforce different kinds of learning I think using both is needed.
* Presenting an overarching theoretical perspective in a course, especially one that demonstrates underlying ideals is useful for situating all the readings, so that critical thinking skills and a consideration for social justice can be linked to a framework of analyzing “unintended consequences,” or determination of participating actors and interests.
* Practical considerations like professional development should be integrated in to the whole course, both to support student growth, and because linking to these practical considerations grants importance and legitimacy to more challenging or theoretically distant materials.
* Make space for and require student participation and feedback, some students gain from hearing or giving verbal articulations, and it will give you a chance to have more dialogic interaction than written comments on writing.
* Keyword concepts that are explanatory such as, networks, social capital, systems, or power can be introduced and used to connect multiple readings and specific theories. These keywords function as preliminary markers of relationships that they can carry into and past the course materials.
* A little levity is a good thing, because it breaks down resistance and asks for attention when it may be slipping. Serious topics are best discussed once momentum and attention are already focused.
* My research interests focus on the analysis of construction, conflict and interaction between knowledges and expert knowledge systems and their participation in daily life, but this is often challenging for students. Many students do not think of expertise and knowledge as multiple, they have often learned to accept without question the answers and information provided through authoritative channels.

I consider this approach applicable in a wide range of courses, are qualified/would like to teach, giving a few concrete examples.