Joe P. Salamon: Teaching Statement

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I have been a TA for many classes at UCSD, for every undergraduate course level for every set of majors the Physics department services. My most valuable teaching experiences come from being the Lab TA Coordinator (LTAC) for the Mechanics, Electricity and Magnetism, and Waves, Optics and Modern Physics labs for Life Science majors, usually called the 1 Series lab courses (1ABCL). I had the chance to engage in a variety of unique teaching and learning opportunities with both the students and the TAs.

If I had to reduce my teaching philosophy into core ideas, it would boil down to converting the classroom into a diverse, inclusive learning community, achieved via the implementation of consistent feedback cycles, active student-centered learning, and instilling a growth mindset amongst all students through constant self-reflection. These principles are the main driving force for my 1ABCL office hours, which are comparable in size to a discussion section (anywhere from 5-35 students). To start, I make it clear that these sessions are for open dialogue on the course content. This allows students to focus more on their own understanding and less on my authoritative expertise. I group students working on the same course material together, thus encouraging them to engage in peer instruction as I walk from group to group to step in and join the varied conversations. In this manner, I can help more students tackle conceptual obstacles by discussing their views or conceptual framework for the course content. This has the added benefit of allowing me to gauge the class’s misconceptions and relearn how non-experts see the material. Ultimately, the above setup ensures that students in my office hours feel comfortable exploring their learning and misconceptions, as they recognize they are in a safe, positive learning environment: they feel at ease.
making mistakes, questioning their understanding, then trying again, armed with feedback from me and their peers. As a result, students in my office hours end up engaging in very active learning sessions, and come to realize that expertise is learned and cultivated as each quarter progresses.

I was awarded a Summer Graduate Teaching Fellowship for the 2013-2014 academic year, which gave me the opportunity to apply my teaching philosophy to Physics 2D, a lower-division course for scientists and engineers on Relativity and Quantum Physics, during the 5-week Summer 2014 quarter at UCSD. I found the most effective way to implement my philosophy was by flipping the classroom, a method which ensures that students can confront all the harder material during lecture with the TA and me present to guide their learning.

The entire course was guided by course-level learning outcomes, which in turn were supported by lecture-level learning outcomes. These learning outcomes guided not only myself in creating all the course material from scratch, but also the students in figuring out which skills they needed for every lecture topic.

The students would read guided pre-lecture reading assignments on the basic material for each lecture, and were given reading quizzes through Blackboard to have a chance to practice this base knowledge before lecture. This ensured that the majority of the class had a base level of informational background coming into class.

During lecture, I kept my presentation time down to a bare minimum, so that the students could spend as much time as possible going through in-class worksheets in groups of 3 – 4. These worksheets were designed to encourage group discussion as much as possible, and were written to progressively increase in conceptual difficulty. During this time, the TA and I would roam around the classroom and assist groups that got stuck or needed a little more guidance. The worksheet activity time was divided into 5 – 15 minute chunks by class-wide peer instruction questions.
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I used iClicker technology to have students be able to vote on their answers for these questions. These were divided into two main categories: checkpoint and discussion clicker questions. The checkpoint questions were used to synchronize the class, and ensure that the entire class knew specific information before carrying on with the rest of the worksheet. For these questions, students would vote individually only. The discussion questions were peer-instruction questions used to highlight difficult concepts. For these questions, students would vote individually, discuss their reasoning with their peers, then vote again. These questions brought out any preconceptions or misunderstandings by having students practice explaining their understanding of physics to each other. After the results of the second vote, I would lead a class-wide discussion to make sure we were all on the same page regarding the underlying physical content.

Post-lecture, students were required to reflect on their learning by writing some metacognition notes. I gave minimal guidance via optional writing prompts, and the students were required to answer with 100 – 200 words. This opportunity to look back at the material gave students the chance to gain a different perspective on what they had learned, as well as think about its applications to everyday life.

Their understanding of the material was assessed via weekly quizzes, in which students were required to solve multi-step problems in blue books. Many of the questions required them to explain or justify their reasoning, and occasionally qualitatively describe the higher-level conceptual content of the course. Overall, the course was a great success: my class outperformed all previous 2D classes I had ever TAed, with more difficult material, a more intense workload, and roughly the same level of grading difficulty. I chose questions from the CLASS survey to give my students both pre- and post-course. Their overall expertise gain from taking the course was 7.1 percentage points, which is far higher than the average standard gain values, especially considering the 5-week duration of the course.
As a more quantitative follow-up to my qualitative assessment of the course, I decided to study how the quality of self-reflection in the metacognition entries correlated with quiz scores. As I had over 900 entries to go over, I simply did not have the time or the resources to categorize, rate, and cross-check with other readers when rating the quality of these entries. I considered a variety of proxy factors, and finally settled on two simple metrics: word count, and word frequencies.

Word count did not show much of a trend, as most students were seemingly randomly scattered within the 100 – 200 word limits. The only noticeable effect was that students outside of these limits did worse.

Word frequencies were much more interesting. I categorized the types of words used into physics jargon, math jargon, class/course logistic words, ideas, verbs, and descriptors. Surface-level differences started to emerge when comparing the top and bottom quartiles of the class. The top quartile students emphasized physics jargon more, and used the word “think” more frequently than “understand.” The bottom quartile students emphasized “understand” over “think”, in almost the reciprocal ratio.

The natural progression from this point was to determine whether the word frequencies of week-averaged metacognition entries corresponded to the weekly quiz scores for both the top and bottom quartiles of the class. Both top and bottom quartile students did worse on weeks in which they used course logistics-related words more (e.g. “lecture” or “flipping”). Interestingly, the top quartile students performed better as they used math jargon more, while the bottom quartile students did worse.

I hope to investigate metacognition in future courses I teach in much more detail, and ensure that my students receive the best possible, evidence-based teaching practices when taking my classes. Self-reflection is a critical part of the learning process, and I aim to ensure its integration in all of my courses.
Here are some teaching evaluation comments from when I was an instructor for the flipped Summer 2014 Physics 2D course. These are my students’ unedited responses:

- “Seriously one of the most available and most accommodating professor I have ever had. Its tough teaching such a difficult course but he does well, especially considering the average for a class of this difficulty is typically much lower than what our class average is. I feel like you will get the best understanding of PHYS 2D from Joe as compared to other professors here at UCSD.”
- “Speaks clearly and shows a genuine concern for the student’s learning.”
- “Joe Salamon is a great great great instructor. Even though he’s just a graduate student, I’ve learned more from him than some of my other professors. Joe is an amazing individual, very kind, very thoughtful, and takes the time to explain material concisely and effectively. He will answer anyone’s questions, and will not stop until every student has understood the material. I sincerely recommend this instructor.”
- “good instructor. the flipped classroom environment he provided forced me to learn the material”
- “A very nice professor and a great teacher. The topic at hand was rather difficult and I feel like he did a good job trying to teach us the material. It seemed like he cared more about his students than most professors these days in my opinion. His flipped classroom method, I feel was very effective learning tool. Something new, I was a bit skeptical but in the end I was convinced.”
- “He pretty good at teaching, he knows his stuff well and know how to organize it in order to help us to learn it more efficiently. He is concise and teaches us the essense of the book.”
- “I have no complaints whatsoever about Joe. He was very helpful and insightful. When I had a question, he was very good at giving an explanation, and sometimes it would leave me with more questions than answers but it made me think a lot about the subject material. One of the only things I didn’t like was how late the homework was put up for each day. However, after midway evaluations that he had the class do, he stayed very on top of all the information on the website and he was very good about putting up assignments several days earlier. I think he responds very well to the students and he does a very good job of explaining difficult concepts compared to other teachers in physics that I have had in the past. I would definitely like to have Joe as a teacher or T.A. in a future course.”
These are some unedited teaching evaluation comments from students from my time as a teaching assistant at UCSD, in no particular order:

- “I appreciated how he would come around to check in on the lab groups, even when we weren’t specifically asking a question, and make sure that everything was clear because sometimes we thought we understood something but really didn’t.”
- “Really great at getting students to reason through questions.”
- “Very patient and gives thorough explanations to problems. He obviously enjoys the subject and is passionate to help other students understand physics as well. He drops by the labs to make sure the lab TAs are teaching the course correctly and kindly answers students lab procedure/conceptual questions as well.”
- “Always there to explain things that was confusing to us. Approachable person!”
- “I oftentimes went to Joe’s office hours and he was fantastic. He answered all my questions while still encouraging me to make my own connections and conclusions. He was very kind, calm, and seemed genuinely interested in the material. I really appreciate the work he did as a TA.”
- “An ability to gauge the class as he is teaching and adapt his presentation to mirror the level of understanding of the students. I think a large part of Joe’s success is due to his approachability and un-intimidating persona. I feel like he is there to help, not look down on students.”
- “If Joe was a professor for lower div physics classes, we would have more people consider becoming physics majors; he is an amazing teacher. Homework grading was does rigorously with specific comments given to each individual. All around the perfect TA.”
- “Joe is awesome! He listens, he’s crazy smart, he knows how to teach you something in different ways so that it clicks and he’s really passionate about his job. Best TA ever.”
- “I really liked how he kind of approached our questions slowly, asking us basic things and trying to get us to work our way to answering the question. He has this weirdly reassuring vibe – in lab, I’d be internally freaking out because I really don’t understand what’s going on, but when he comes around and answers questions, explains things, or gives hint on how to really get the concepts down, it makes me feel a lot better.”

Updated October 3, 2015.