

August 2, 2016

Hi everybody,

I trust you're having a good summer. I'm writing now to relate what I've learned since your final exam.

Students did well on the final and the course grades break down accordingly:

Class	%A	%B	%C	%D	%F	other	Total #
PHYS-141-05	12.5	35.4	33.3	12.5	4.2	2.1	48
PHYS-141-08	14.6	41.7	39.6	2.1	0	2.1	48

Your evaluations of me as a professor are lower than fall and winter quarters but higher than previous years. Also, it is curious to me that the earlier class, with lower average performance rated me higher as an instructor than the later class with higher average performance. For my student evaluations complete with student comments, please see:

<http://sharedcurriculum.wikispaces.com/Schwartz+Student+Evaluations+2016>

Additionally, you took several surveys. The “how I am thinking about physics and learning physics” surveys that you took at the beginning and end of the class shows that you as a group shifted your thinking to be more like expert physicists. This is significant because studies show that most introductory physics classes teach students to think *less* like expert physicists. Please feel free to read the study at: <http://www.colorado.edu/sei/class/CLASS%20I.pdf>

The survey you took regarding “what was your experience like in the class and how can we improve it?” is summarized below. It indicates a vast breadth of student experiences and preferences. Likely, my take away is to give space for students to learn as they like.

I went to two conferences this summer dedicated to physics education. People expressed considerable interest in our class. Additionally, I have submitted a publication to The Physics Teacher regarding parallel pedagogy. The summary for the paper is included below.

I value the learning experience you gave me in facilitating your mechanics class this past quarter. I plan to continue studying the learning process with my future classes and will continue to value communications with all of you. Please feel free to visit me at any time in the future.

Thanks
Pete

Responses for “My Experience in Physics Class” Survey

Q1 How Students Learned: On average, students reported that most of their learning came from other students (36% of learning), followed by interactive videos (31%), class lectures (21%), other online sources (6%), office hours (4%), and textbook (3%). “Class lectures” should instead be “class activities,” as I rarely lecture. The low textbook use may be partially because we lack a parallel pedagogy textbook. A student and I are presently revising the OpenStax textbook to better follow our class timeline.

Q2, Office Hours: This response was widely varied, from “they were no help because Pete *didn't* help us.” To “they were great because we worked together.” To “They were great and Pete *did* help us.”

Breakdown of responses and number of students who chose them

A few students: Scheduling: Didn't have time to go, interfered with other classes.

A considerable amount: No need: the times I came usually consisted of people working on problems outside the office. I usually did problem sets on my own and met up with people to work on them before exams. I felt that the group work in class was sufficient **OR** Most questions were answered in class. Also time conflict with other classes **OR** I found that, since so much of the learning in the class was already through my peers, I went to them first. Failing that, I went to the videos again. And I never had either of those two things fail to explain something to me to an extent that I felt forced to go to office hours for my own understanding.

Lots of Students: No Help:

I didn't like that you just made us ask other students. They usually were no help

To be honest, they confused me more because I was discussing with people who were also confused.

Many students: They Were Great: I came and really enjoyed when I did. I always learned a lot. **OR** I liked going because I could get help with problems, and everyone was very helpful. **OR** I came to office hours almost every single time. I found it to be the backbone of my learning experience. I learned more in office hours than I did in class and from study sessions.

OR Office hours were very helpful; I not only developed relationships but also learned a lot from my peers. It was also very helpful to be able to directly ask the instructor for help.

Q3, Textbook: Reasonably strong agreement that we should write a parallel pedagogy textbook (3.5 agreement out of a possible 5, or “3.5/5”)

Q4, Why Students Stopped Doing HW: Wide variety of responses as to why HW dropped off. 57% of people think that HW should continue to be not graded, as opposed to 18% who think it should be graded.

Q5, Projects: Students found the projects and working with others valuable, though they also increased stress. Only 14% indicated we should not have projects in the future.

Q6, Big Exams: You found them beneficial for learning and preparing for exams.

Q7, Big Exams: Largely, students liked them as they are. I will potentially try to make sure that they are not too long to finish in the allotted time, which was the largest complaint.

Q8, The grading policy: The current policy (only exams, videos, participation count toward final grade) was well received, and students claim that it encouraged them to think more conceptually (3.8/5).

Q9, Flipped Classroom: Moderate support for posting practice questions on PlayPosit to be done the same day. – maybe we can put them in our new text?

Q10, Parallel Pedagogy was accepted well by students, but many claim it was crazy at first (3.8/5). Strong agreement that it resulted in students thinking more about concepts (4.0/5). 17% of the students disagreed with the statement "I adjusted to the parallel pedagogy very well." and 74% agreed or strongly agreed with the statement, "Parallel pedagogy resulted in my thinking more about concepts."

Q11, Emily and Colin's Presence in Class enhanced the learning experience (3.9/5)

Q12: Students moderately agreed that **Socratic Teaching** resulted in more frustration and more learning. There was an equal amount of agree and disagree (2.9/5) to the statement that “instructors should just answer student questions.”

Q13, Reflection: Students found reflection reasonably valuable (3.7/5)

Q14: There was no strong effect reported from the statement, **“we were encouraged to think about how we feel.”**

Q15: Students learned more about how we learned when we had **dedicated discussions about learning** than when we had reflection practices.

Q16, Flipped Classroom: Most people valued the experience and relationships (3.95/5) and didn't have a strong statement about whether they learned more this way.

Q17: The majority of the students either liked the **flipped classroom** immediately (15%) or grew to like it (53%). 33% don't like it.

Q18: The videos had the effect of replacing about equal amounts of lecture and textbook.

Q19: On average, most **students enjoyed physics** a little more than they thought they would.

Q20: Students thought it was fine to have this many surveys questions. Only one person wanted more.

Summary of submitted manuscript: “Parallel” pedagogy covers the four mechanics concepts of momentum, energy, forces, and kinematics simultaneously instead of building each concept on an understanding of the previous one. Course content is delivered through interactive videos allowing class time for group work and student-centered activities. We start with simple examples building complexity throughout the course with the introduction of springs, two-dimensions, vectors, energy diagrams, universal gravitation, and rotation. Success means that students ponder underlying physics concepts rather than hunt for formulas. Surveys indicate that students accept this learning model well and have considerable improvement in applied conceptual understanding.