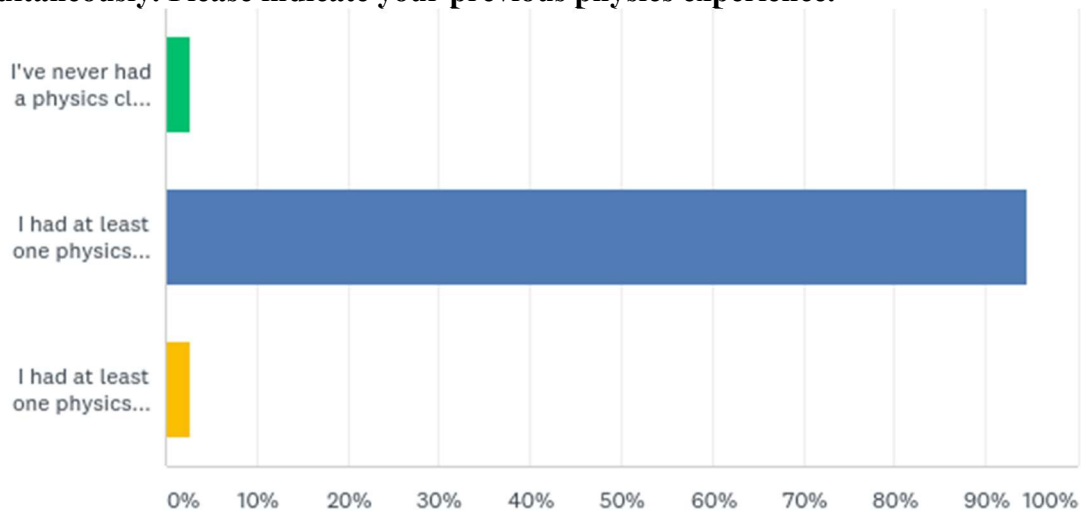
Q1: We studied physics in a "flipped classroom" format, learning about the concepts simultaneously. Please indicate your previous physics experience.

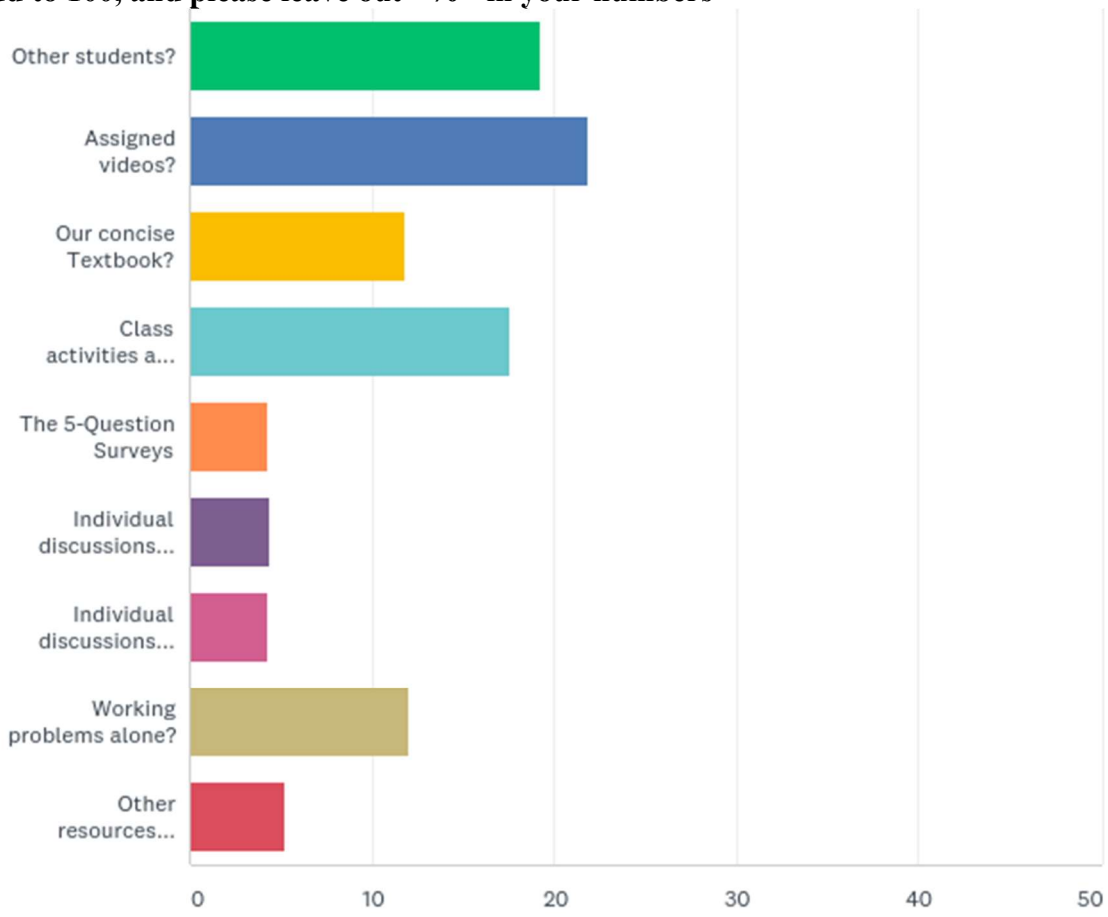


ANSWER CHOICES	RESPONSES	
I've never had a physics class before	2.70%	1
I had at least one physics class before in a conventional lecture format	94.59%	35
I had at least one physics class before in a "flipped classroom" or "quasi-flipped classroom" format.	2.70%	1
Total Respondents: 37		

Q2: Please indicate your preferences for the different elements of our learning method

	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE	TOTAL	WEIGHTED AVERAGE
The flipped classroom is more effective for learning physics than the standard lecture format	2.63% 1	13.16% 5	28.95% 11	36.84% 14	18.42% 7	38	3.55
Learning concepts in parallel is more effective for learning physics than the traditional "series" method	2.63% 1	7.89% 3	15.79% 6	36.84% 14	36.84% 14	38	3.97
being required to talk to each other before addressing the instructor is more effective for learning physics than the traditional "ask the teacher and they will answer".	5.26% 2	10.53% 4	26.32% 10	34.21% 13	23.68% 9	38	3.61
Learning physics by our "new" method is more fun than the traditional method	2.63% 1	7.89% 3	21.05% 8	34.21% 13	34.21% 13	38	3.89
Learning physics by our "new" method takes more time than the traditional method	0.00% 0	28.95% 11	26.32% 10	31.58% 12	13.16% 5	38	3.29
Our format allowed me to develop valuable working relationships that might otherwise not have happened.	2.63% 1	5.26% 2	23.68% 9	39.47% 15	28.95% 11	38	3.87
Our instructor didn't do their job as an educator.	47.37% 18	34.21% 13	15.79% 6	0.00% 0	2.63% 1	38	1.76

Q3: What percentage of your learning came from these different resources? Answers must add to 100, and please leave out "%" in your numbers



ANSWER CHOICES	AVERAGE NUMBER	TOTAL NUMBER	RESPONSES
Other students?	19	730	38
Assigned videos?	22	832	38
Our concise Textbook?	12	438	37
Class activities and minilectures?	18	667	38
The 5-Question Surveys	4	160	37
Individual discussions with course instructor?	4	162	37
Individual discussions with learning assistant?	4	159	37
Working problems alone?	12	458	38
Other resources (people, printed material, online)?	5	194	37
Total Respondents: 38			

Q4: If you listed "other" above, please list what that other is and any comment that you like.

I had a tutor from the department that helped me.

Google and some previous knowledge

Past class

I'd consider my other resources seeing something happen at some point during the quarter outside of class and connecting it with a hat we learned in class

People who have taken physics before

google

youtube videos

old teachers, online videos.

Q5: Please describe your experience with the Learning Assistants (LAs)

	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE	TOTAL	WEIGHTED AVERAGE
I had significant engagement with the LAs	10.53% 4	15.79% 6	34.21% 13	28.95% 11	10.53% 4	38	3.13
I felt comfortable talking with the LAs	0.00% 0	2.63% 1	10.53% 4	60.53% 23	26.32% 10	38	4.11
The LAs were good at recognizing when to intervene	0.00% 0	5.26% 2	15.79% 6	63.16% 24	15.79% 6	38	3.89
The LAs positively enhanced my physics learning	0.00% 0	2.63% 1	26.32% 10	52.63% 20	18.42% 7	38	3.87

Q6: About what portion of the textbook did you read?

	0%	20%	40%	60%	80%	100%	TOTAL	WEIGHTED AVERAGE
Portion of Textbook I read	0.00% 0	16.22% 6	13.51% 5	24.32% 9	32.43% 12	13.51% 5	37	4.14

Q7: Please describe your experience with the textbook provided to you chapter by chapter.

	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE	TOTAL	WEIGHTED AVERAGE
It provided needed background to supplement the videos	0.00% 0	5.26% 2	15.79% 6	68.42% 26	10.53% 4	38	3.84
It was unnecessary because the videos provide everything I need	10.53% 4	50.00% 19	15.79% 6	21.05% 8	2.63% 1	38	2.55
I carried the chapter hard copy around with me.	5.26% 2	10.53% 4	2.63% 1	52.63% 20	28.95% 11	38	3.89
I wrote all over my hard copy.	18.42% 7	44.74% 17	15.79% 6	18.42% 7	2.63% 1	38	2.42
I liked that it was short and simple.	0.00% 0	0.00% 0	10.53% 4	44.74% 17	44.74% 17	38	4.34
It should be longer and more complete	16.22% 6	29.73% 11	32.43% 12	16.22% 6	5.41% 2	37	2.65
I generally used all the examples and would appreciate more	5.26% 2	23.68% 9	36.84% 14	31.58% 12	2.63% 1	38	3.03
If there were space after each example, I would have given the examples an effort to solve them in the text.	2.63% 1	23.68% 9	18.42% 7	34.21% 13	21.05% 8	38	3.47
I also used a "regular" physics textbook.	60.53% 23	34.21% 13	2.63% 1	2.63% 1	0.00% 0	38	1.47
I mostly used the soft copy online.	31.58% 12	31.58% 12	7.89% 3	18.42% 7	10.53% 4	38	2.45

Q8: Please offer any other thoughts / requests / advice with respect to the textbook.

The textbook was very concise and to the point I appreciated the work that was put into making the textbook so straightforward

I would have liked more WORKED practice problems to look at. Sometimes I would get stuck and having worked problems to look at would have been helpful

wish the textbook examples had solutions, so we could figure out how to solve them.

I felt that I took better notes and understood everything better from class discussions and the formulas/examples you would write on the board

It was great! I would recommend getting it formatted more like a traditional textbook to make it easier to find chapters and such.

Have a little more written explanation of the concepts rather than more examples

I personally use the worked examples in traditional textbooks a great deal. I don't know if worked examples would fit this style of teaching but I did have to get used to not having worked examples in the text.

I think offering the whole textbook at once would be kind of cool

I said I only read 20% because I probably only sat down with the purpose of reading the chapter the first two chapters. I still found it very helpful to refer to and used it often to check my thinking was correct or look at an example but did not read the whole thing word for word. I really liked how it was written and broken into small chunks so information was easily accessible and I will keep it for Future classes As a refresher

Walk through a little about how to do some problems

Good

I absolutely love the textbook, its the single most helpful resource i've ever used for any physics class.

maybe have explanations for students who are still kinda lost.

Q9: We watched videos through the PlayPosit website, recording our answers. Please indicate your level of agreement with each statement

	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE	TOTAL	WEIGHTED AVERAGE
I watched the videos on time.	0.00% 0	0.00% 0	7.89% 3	50.00% 19	42.11% 16	38	4.34
I took notes during the videos so I could remember and I could ask questions the next day in class.	2.63% 1	18.42% 7	28.95% 11	42.11% 16	7.89% 3	38	3.34
I made sure I was in a classroom-like setting when I watched the videos: free of distractions and/or music, other videos, TV.	5.26% 2	21.05% 8	31.58% 12	26.32% 10	15.79% 6	38	3.26
I watched the videos with other students.	28.95% 11	52.63% 20	7.89% 3	10.53% 4	0.00% 0	38	2.00

Q10: Few students came to office hours. Please explain why you did/didn't come and what this was like for you:

Your office hours conflict with my other class schedules and sometimes I just didn't have time :(

I came to office hours a lot more towards the end of the quarter and found it much more helpful when I wasn't the only one

Whenever I had a question I couldn't wait for office hours to come around, I had to figure it out.

I'll be honest, I wanted to come to office hours just to talk with Pete because he seems like a really interesting person, but I never had any real physics questions, everything made sense, so that would have been a little strange...

I did come to office hours which was very helpful for me. It was nice to talk with the instructor about different problems I was having.

I did not come because I felt I could get my questions answered in class.

I didn't go, as I heard that it was a pretty bad experience. Since you keep questioning students, you guys go through 1 or 2 problems the entire time, and this is not practical as we are pretty busy and you can't answer all our questions.

☐
I came after the first class and definitely enjoyed being there. I only went because you offered to hand out the textbook, but I stayed because you were telling interesting stories. I didn't really have any physics questions as everything seemed straightforward, but if there were more incentive to go to office hours (maybe hand out the textbook chapters there instead of during class?) then I definitely would have gone and enjoyed it.
☐
I only decided to come when I had questions that I was really stuck on/had a project to fix.
☐
I felt like I had a good grasp on the content and would have come had I felt like I needed to. Also with the resource of the many other students in the class I felt the were the first people I would go to.
☐
I came to office hours for help on my first group project. Going to office hours really helped me to understand why what I had previously done on my project was wrong and how to correct it for later
☐
I did not go. I thought I had a decent understanding of the material and could clarify my understanding using the book and resources provided on your website.
☐
I didn’t really find the need to come to office hours when I had other resources around me such as class mates for help.
☐
I should have gone more but I sometimes I don't even know what to ask.
☐
I forgot when the office hours were (I still knew where to find them), they were in hours that I couldn't always go (other obligations), and/or I didn't have any pressing questions that needed answers or explanations to.
☐
I have classes during your office hours
☐
Office hours didn’t fit my schedule all too well, and I often got caught up doing other work
☐
Pretty much all of my questions were discussed in class.
☐
I didn't feel like I could approach the instructor because of their insistence on approaching other students first.
I asked questions I had during class time
☐
I felt like if I went, I wouldnt get much help because we are so encouraged to focus on talking to other students
☐
I only went once and it wasn't really for physics necessarily but also one of the things that discouraged me from going was the emphasis put on getting help from other students and in this class I didn't have a lot of friends/people I clicked with but I still felt like I would get in trouble if I went to office hours without consulting other students first.
☐
other conflicts
☐
I came to office hours quite a bit, but less towards the last few weeks. Office hours were always helpful but were more helpful when there were others with you, so towards the end I tended to talk with other students outside of class when our scheduled met up. Office hours were very helpful especially towards the beginning when we were learning not only physics but the style and structure of the class.
☐
I had heard that office hours would be less useful than asking other students.
☐

I came in to office hours a lot. It really helped me to understand the material better, and also learn how to explain it better

I loved coming to office hours because I felt it increased my learning a bunch whenever I came

I came once, I especially liked the after-class discussions
Had class at every time

I came and was given help on our project

it was more beneficial to talk to our peers than to go to office hours.

Q11: We had two projects during the class. Please indicate your level of agreement:

	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE	TOTAL	WEIGHTED AVERAGE
I learned a lot of physics doing the project	2.63% 1	13.16% 5	23.68% 9	47.37% 18	13.16% 5	38	3.55
I found value in the project group work	2.63% 1	2.63% 1	15.79% 6	57.89% 22	21.05% 8	38	3.92
The project increased my stress	0.00% 0	26.32% 10	26.32% 10	42.11% 16	5.26% 2	38	3.26
The project positively impacted my learning experience	0.00% 0	7.89% 3	23.68% 9	60.53% 23	7.89% 3	38	3.68

Q12: We USED to have two full-class midterms. However, our class had weekly assessments, counting only six and replacing them with the final exam if the final exam is higher. Because of this:

	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE	TOTAL	WEIGHTED AVERAGE
I learned more	0.00% 0	5.26% 2	18.42% 7	52.63% 20	23.68% 9	38	3.95
My test anxiety was reduced	2.63% 1	5.26% 2	18.42% 7	31.58% 12	42.11% 16	38	4.05
I studied more	0.00% 0	21.05% 8	28.95% 11	36.84% 14	13.16% 5	38	3.42
It was more fun	2.63% 1	5.26% 2	18.42% 7	44.74% 17	28.95% 11	38	3.92
I prefer having weekly assessments rather than two midterms	0.00% 0	5.26% 2	5.26% 2	44.74% 17	44.74% 17	38	4.29

Q13: Homework participation tapered off near the end of the quarter. Check all that apply.

ANSWER CHOICES	RESPONSES	
I continued doing the problem sets on time, but didn't hand them in.	28.95%	11
I continued doing the problem sets after the solutions were out and finished them.	15.79%	6
I did part of the problem sets, choosing the problems I thought were important.	42.11%	16
I stopped doing the problem sets altogether.	15.79%	6
Near the end of the term, I got behind in everything and spent less time on physics.	34.21%	13
My choices were in my best interest.	36.84%	14
My choices were not in my best interest.	23.68%	9
We should get points for the problem sets to incentivize doing them.	28.95%	11
We should continue being graded only on Exams and the projects, allowing us to be motivated to do problem sets by our interest to learn.	57.89%	22
Total Respondents: 38		

Q14: Homework and attendance was not calculated into your final grade. Because of this,

	WAY LESS	LESS	THE SAME	A LITTLE MORE	WAY MORE	TOTAL	WEIGHTED AVERAGE
i enjoyed class	2.63% 1	2.63% 1	36.84% 14	23.68% 9	34.21% 13	38	3.84
the amount of homework I did was	13.16% 5	39.47% 15	36.84% 14	5.26% 2	5.26% 2	38	2.50
I learned	2.63% 1	7.89% 3	31.58% 12	36.84% 14	21.05% 8	38	3.66
I thought about concepts	2.63% 1	2.63% 1	18.42% 7	42.11% 16	34.21% 13	38	4.03

Q15: We made prolific use of "Appropriate Technology Clickers". Please describe your experience with this.

	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE	TOTAL	WEIGHTED AVERAGE
This was an effective way to gain feedback and engage students.	0.00% 0	5.26% 2	34.21% 13	39.47% 15	21.05% 8	38	3.76
It would be better if we had real electronic clickers	31.58% 12	34.21% 13	23.68% 9	10.53% 4	0.00% 0	38	2.13
it would be better to ask fewer questions in a class	21.05% 8	31.58% 12	42.11% 16	5.26% 2	0.00% 0	38	2.32

Q16: Please offer any additional thought you have about "appropriate technology clickers" including support for why you answered the way you did above.

I really liked that part of the class the most I think! It made the class way more interactive and fun to participate in.

Was a lot better for whole class involvement and discussion

I don't have a strong opinion about the verbal feedback.

What's an appropriate technology clicker?

It made answering sometimes difficult if you are unsure of the answer, so only people who know the answer/are the loudest participate. Anonymous clickers would probably reduce the bias in the answers, although I realize they are overpriced a lot of the time.

I enjoy seeing Pete confused about why so many students are always talking about Calculus class before Physics class starts

I don't think clickers are necessary. I like how you can judge the class's understanding of a question by the volume and agreement for a response.

I feel like sometimes you told us to talk out of nowhere and I was just confused about what we were supposed to be talking about

I liked being able to hear what other students were talking about and thought it was a fun way to start class.

it allows all students to participate and engage in discussion

I liked it because it kept the class engaged. Real clickers wouldn't be as effective because you just have to click a button, but saying it out loud holds you accountable for your answer kore as others hear you. It wasn't always the most effective at getting an answer because it sometimes sounded like mumbles but that generally meant we did not agree so that counts as success for what we needed

It was another way to learn.

i'm not sure what this is

good

I am not sure I know what this is

sometimes people don't want to answer in fear of being wrong.

Q17: Before this class began, think about how much you thought you were going to enjoy physics. Compared to how much you thought you'd enjoy physics, you actually enjoyed it...

	WAY LESS	A LITTLE LESS	THE SAME	A LITTLE MORE	WAY MORE	TOTAL	WEIGHTED AVERAGE
(no label)	2.70% 1	13.51% 5	27.03% 10	27.03% 10	29.73% 11	37	3.68

Q18 Maybe there's something you'd like more of in the class… but we can't make the classes longer, (we have to conserve time) so we would have to drop something else. Thus feel free to suggest move time between a pair of activities: So you could say, "spend less time doing demos, and more time allowing us to work in groups." Or you could write, "stop demonstrating how to solve problems, and instead start playing loud music."

I really thoroughly enjoyed your class, I wish we just had more time each day instead of an hour because it tends to rush the lesson and not necessarily have enough time for questions.

I liked how you held "extra hours" after class which allowed students confused about the topics discussed to talk with you

Maybe give the questions for the day before class so we can spend more time discussing and less time calculating.

The way you have the class now is probably beneficial for most people, but personally I would prefer less demos and more worked problems on the board

I enjoyed this class. The only thing I would like to suggest is spending time to work on the problem set together as a class after we turn them in. Sometimes I can not get a problem and then we never go back to review it.

please, spend more time demonstrating how to solve problems. I had to ask my friends, who also didn't know it

Everything seemed really great

Demonstrate the problems at a slower pace.

Little less group work and more demos, I am a visual learner and the demos help.

Try to eliminate dead time in between questions and answers, e.g., moments where the concept is well understood and 15 or so minutes are spent discussing it, or moments where the concept makes no sense to a majority of the students and therefore there is silence for a few minutes in between each question while the students wait for some pointers.

More time to do work in class in groups would have been pretty cool

Spend less time having us discuss things that it seems like the class understands and spend more time helping us understand the more confusing topics.

I liked being able to work in groups and ask questions and I loved the demos but it usually stressed me out to have to work problems out in class because I always felt rushed because I need it to be quiet and I need more time to work out problems. Eventually I would stop doing the problems because I knew that I would always not have enough time to finish them

more demos and demonstration and more projects

spend more time finishing the problem instead of taking a lot of water breaks (but a moderate amount of breaks to talk to students is helpful)

Maybe a little less time to consult in groups, and a little more time with problem set up

loved it

good

I feel like sometimes nobody knows what's going on and then you tell us to "talk about it." Sometimes we're able to come to a sort of conclusion in this situation, but most of the time we don't know what to talk about and don't really come to an answer. In a situation like this, it's helpful to get a concrete answer after the discussion just to make sure we're on the right track.

demonstrate more problems, let groups talk a little less.

Q19 Enter any other comments about the class that you would like to communicate.

I really enjoyed your class Pete. It made me look at a lot of things differently including people, relationships, the way we perceive things, and of course physics. I definitely appreciate physics more and enjoyed looking at the class through multiple lens. I think that helped a lot more than just punching in formulas and looking at concepts separately rather than simultaneously. Thank you for such a great quarter, I was very sad on the last day and I will miss your class a lot :)

I enjoyed this class a lot and thought it was the best way to learn in the first set of physics classes we are required to take

It was enjoyable and I learned a lot!

I thoroughly enjoyed it!

Most important: I think that asking peers for help is very, very flawed. I learned so so many misconceptions from my peers, and sometimes their collective voice told me i was wrong, even though i was the only one who was right. Not blaming them, because I also didn't have proper justification. Everyone was very confused, so please spend more time on demos. I ended up knowing half the class as I had to continuously switch around to find people who knew the answer to something I needed help with.

I absolutely loved being in this class, and it was definitely something I looked forward to daily. I don't know how much of that was physics, and how much was Pete, but if I can take another class with him in the future I think I definitely will!

I wish the assessments were longer because one of my biggest struggles is doing physics quickly. When thinking about lenses especially, it takes me longer to really get through a problem.

I support innovation in different forms of education so having a flipped classroom was interesting. I feel like having both homework in watching the "lectures" online and doing the actual homework adds more work for the students (who still have to show up to class), but not grading it does alleviate some of this. One aspect that I feel like does need work is motivation: the student must spend the time to consider concepts and come into class with an adequate understanding of what's going on in order to be successful. Some may say that this (student motivation) is the key difference between top achieving schools such as MIT and other run-off-the-mill public schools. This is not helped by the fact that the teaching method is unconventional - people (including me, although I try to go above it) are naturally opposed to change and won't automatically adapt to new methods. Another more minor issue is the high variability in a learning method that is dependent student-to-student interaction. This is because this requires students that are willing to speak up in class and also requires there to be students that are already effective learners or that already understand the concept (that can also communicate with others). There were moments in the class where the concept was abstruse enough that no student could comprehend it fully, and I felt the room slowing down during these moments as the teacher more frequently encouraged discussion that led no where and the students waited more for the teacher to just give them the right explanation. I feel like these moments lead to the opposite of what was intended - that the students are just being fed straight answers by the teacher. No specific concepts or days come to my mind as I write this, but I'm sure you understand what I mean (or remember the feeling I'm describing). To alleviate this, I recommend "reading the crowd" and providing just enough intermediate steps or ideas so

that the students can come to the final conclusions (mostly on their own). This could be providing the correct angle of attack (not necessarily the lens) or reviewing a related concept(s). All in all, I had no problems in the class. I am, of course, speaking too soon since the final is what worries me and I am typing this before that. The flipped classroom is an interesting concept and I can see its potential in being superior to a conventional method, but I feel that it still has flaws that need to be ironed out. Because of the required student effort, the best criticism for this method is from the students themselves, and I recommend asking (not pestering) for feedback just after days that just feel "off" or when things aren't going as well, and preferably so that students can share in private and have time to formulate thoughts (like those small, blank response slips, maybe give them out at the end of class and hand them at the beginning of the next). This would help prevent the dips in interest and/or learning that occur from time to time. Best of luck in refining this teaching method.

My main problem was that I didnt really feel like i could go to you for help because we were supposed to talk to students but sometimes we couldnt figure things out or i just prefer to get help from the teacher. I feel like this class really helped strengthen my knowledge and view physics from a different perspective but this would have been difficult to learn if i didnt know anything before,

I'm really glad I took this class, I feel like I learned so much more than I thought I would and Pete made the hard topics very easy to understand.

n/a

My only concern about this class is how different it will be in my next physics classes and hoping that i will be prepared to also succeed in those style classes but I wish they would teach the way this class would taught because it’s much more fun and easier to learn than traditional ways

I really enjoyed this class! Probably my favorite this quarter

During Thanksgiving break I had a great time showing my family everything I learned about momentum and bicycle wheels and was very grateful for the class. I even stood on a desk chair and showed them how I switched directions when I switched the direction of the wheel by turning it upside down. My dad and I also went on a mountain bike ride together and we had a great time talking about counter-steering and when I tried it on the trail I noticed a big difference in speed. So... Thank you!

You are an absolute sweetheart and a great professor, I am so glad I had you! Stay cool Pete.

good

This really was such an informative class and I felt as if I’ve learned so much and truly understand the material