

Learning Assistant Report

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The purpose of this report is to reflect on my experience as an LA for Charles Chiu's PHY303L course this semester, specifically in my interactions with students in the TA sessions, in office hours, in class and outside of scheduled times. Professor Chiu has also asked that we evaluate the effectiveness of the current program. As part of my duties I attend four hours of TA sessions and hold 3 hours of office ours each week.

Most of my interaction with the students occurs in the TA sessions. The sessions usually consist of the students solving a problem from the book, but about a third of the sessions are dedicated to computer modeling. This is the venue where students ask the most questions. I think the problems are very well chosen for both conceptual and problem solving skills and are great for eliciting students to ask about what they have misunderstood or had difficulty with. I like to use the problems as a chance for the students to solve more difficult problems on their own at first, only answering questions about the problem statement or preliminaries. I try to wait until the students are stuck before approaching them and helping them out. I try to ask them about what they know and how the physics always makes a logical connection from the basic concepts to the specific results. When students get an answer, whether wrong or right, I ask them what their reasoning is and why the answer makes sense. The problems and models usually highlight certain concepts and elicit very good questions about the material. The setup where groups work on problems with help from the LAs is very helpful because the LAs are fellow undergraduates who are still taking the same kinds of classes as the students and can act as a kind of group member with expertise in the course material.

The office hours are another common mode of communication between me and the students. Unfortunately, the attendance can be very low. There is one student who attends all of our office hours and asks conceptual questions, but otherwise students only attend when there is a difficult homework due the next day. I like the online office hours; although it takes more time for me to communicate things than in person, I think that attendance is higher than if we had on-ground office hours. A recent poll taken during lecture in our class had several students say they would like on-ground office hours, but I did on-ground office hours last semester while LAing for Chelikowsky's 303K course and literally never had any students attend except when I held special office hours for final preparation. I think working with students in person works best

when students schedule to meet individually outside of class (see below). One solution suggested by Matt Haley (our TA) is to have homework due earlier, so that students who do homework at the last minute will be working on homework at the same time we are holding office hours.

We have not had very much interaction with the students in class. The only student participation in lecture is the iClicker questions, which are simple conceptual questions that the students answer in the course of about 15 seconds. The students tend to sit with their friends and work on problems together, and they tend to try to work on the problems without our help. A few times students have asked about the answers to the iClicker questions for clarification on a concept, but in general the students have worked alone. I think that the main benefit of my attending lecture is to hear Professor Chiu's presentation of the material for the context in which the students have seen the material presented.

Outside of class I have interacted with students by email/Facebook and through face-to-face appointments. Unfortunately, many of the emails I get are received past midnight the nights homework is due, and I respond after the deadline is up, but I've also been able to help out with problems students have had via e-mail when they couldn't attend office hours. However, by far the most effective interactions I've had with students have been when I've met with students one-on-one for personal help on problems. Only 2-3 students have sought help in this way, but the meetings have always been very productive in helping their understanding. One of the best examples is a student who got a 50 on the first exam - the student approached me about all of his options for getting extra help for the second exam and met with me several times on campus and we worked over the types of problems to work on and how to approach them, and the student's hard work paid off with better performance. I think that this is a question of motivation - I always tell who students with questions that they can feel free to contact me to meet up outside of class but only a few have followed through on contacting me.

I think that the LA program is a good chance for the students to approach peers for help. Some of the students are in the same classes as us, and I see and talk to some of them nearly daily while on campus going to classes. My interactions with the students is not limited to the talking about class, but also what classes we're taking, what internships/research we're working on, or talking about more advanced concepts that they're interested in hearing about.

I've been asked to comment on the effectiveness of the MI program and what I think can be improved. I think that most of the approach is excellent - I like the emphasis on conceptual understanding stressed in the course as well as the TA sessions setup, where the modeling sessions really bring out the physics in a no other course does. I do think that there can be improvements on the methods given in the book and homework. Many students have commented on the disparity between the difficulty of the WebAssign homework and the problems in TA sessions and on tests - the WebAssign homework can usually be completed very quickly and is good for reinforcing concepts, but doesn't always test their problem solving skills like it should. The problems in the TA sessions and tests, however, are closer to the types of problems in the book and usually

present more difficulty. In most courses the homework is much more difficult than the tests and can give the students a lot of practice solving problems, but I think that the students in our course would sometimes be unprepared for tests if they just studied their homework. I also think that the book should sometimes stress the problem solving side of things. Professor Chiu has complained about the book's use of the phrase "by looking up this integral in a table," and I agree that it sometimes tends to downplay the importance of practicing mathematical and problem solving skills. The concepts are the most important part, but learning physics is also about learning how to solve problems, and the concepts only become powerful when coupled with the skills needed to get exact answers for specific problems. I think that Professor Chiu has addressed these issues several times, introducing mathematical derivations of some of the integrals given in the book, and especially by making supplemental problems available to students before tests to help them prepare. In the end, I think that some of the material in the book could be supplemented with better explanations, and I think that if there were a way to assign problems from the MI book (the problems in the book are actually much more difficult than in their homeworks!), it could give the students more practice with trying to solve more difficult problems.