

Educational Philosophy

My efforts in the classroom focus on student learning. Toward that end, I attempt to minimize teaching and maximize learning. One technique that I have found to be very effective, at least at the Naval Academy, is worksheet-based cooperative learning. I have been using that technique for about a decade in various formats. I have used it mostly in general physics classes though I tried it the last time that I taught an advanced electricity and magnetism course. My favorite approach is to talk for about 20 or so minutes then have the students work in groups for the remaining time. During the group time, I interact with the groups when they request it. During the interaction I attempt to get at least one person in the group to understand what is going on then let him or her spread the news.

The following comments apply only to general physics courses. I have found that typical physics problems do not constitute useful worksheets. The reason is that research in physics education has shown that misconceptions are far more widespread and firmly held by students than is usually believed. Many of those misconceptions have been identified. Consequently, the most useful worksheets focus on misconceptions. The other type of useful worksheet is one that helps students learn topics that are not biased by misconceptions but still cause difficulty.

Interestingly, even though there is extra time required for the worksheets, my classes do not fall behind traditional course schedules. The reason is that there are topics that the students understand correctly before beginning our course. I have identified a number of those topics and minimize the time spent on them.

Clearly, this may not be a good technique in other environments and, in fact, may not be the best way to teach at the Naval Academy. I continue to listen as closely as I can to as many teaching experts as possible since I am constantly looking for tips on how to improve the effectiveness of the classroom. In fact, I usually learn something from teaching experts. However, I always ignore suggestions that emphasize teaching at the expense of learning.