

Random teaching tips from Nora Underwood

Note: All of these ideas are stolen from other people without attribution.

1. Learning to teach, developing your teaching style

Steal ideas from other people! In my opinion the best way to learn about teaching is to teach and then discuss problems and questions with other people. It can be particularly helpful to talk to people teaching the same course to find out what they are doing and how it is working. If you find people that are particularly fun to talk with, make a weekly date to share teaching war-stories and ideas.

Prepare thoroughly. This includes making things flow from one class to the next. It also includes planning for contingencies. Think about what to do if you prepared too much material. Where are some logical early stopping points? What will you do if you have too little material? Maybe you will just dismiss class early, but think about this ahead of time. What if you are running a discussion and they don't respond to your first question. What is plan B?

Make notes for next time. *Immediately* after class, jot down notes on what worked and (especially) what did NOT work, and how you might change things next time. Spending 5-10 minutes doing this will save you from repeating mistakes and feeling bad about it the next time you teach. It feels great to find helpful "notes to self" when you sit down to prepare to teach something a second time. This will make teaching a lot more fun and allow you to improve your teaching over time.

Be honest with the students. Don't pretend to know things that you don't actually know. Your job is to help students learn, not to be the repository of all knowledge. If you don't know an answer, tell them that you will get the answer by next class and then do that. Or better yet, teach them how to find the answer. Students need to learn some facts, but it is more important to learn how to get and use information. Not knowing a particular fact is not a sign of weakness as a teacher. In science it is often the case that the answer to a question may not be known by anyone, and that is where science gets really interesting.

Make expectations very clear, and then stick to them. Be clear about where the student's grade will come from, and about what expectations are for classroom behavior. Do this right away, and then stick to it. Don't give extra credit. My particular style is to be firm about basic expectations (e.g. taking an exam), but to try to work with individual student needs (e.g. if a student has a really valid excuse I don't mind them taking an exam late).

Get someone to proof-read or pre-take your exams, quizzes, assignments. When I write a new one, I always pre-take my own exams (timing myself), and then ask at least one other person to also look over it. This will make your life much easier when it comes to grading (ambiguous questions are hard to grade, and incorrect questions are embarrassing). After the assignment is graded, make some notes right away on anything that was hard to grade so you can fix it next time.

Model enthusiasm. Let yourself be excited about what you are teaching, and try to make it easy for students to show some excitement too. I tell students in labs that they get brownie points for “oohs” and “aahs” when they see something cool.

Make sure students know that you care about them learning. This doesn't mean giving away good grades, just showing that you want to work with them and are excited about their progress.

2. A few random methods for use in the classroom

“each-one teach-one”: have students answer each other's questions as often as possible. There is nothing like teaching something to make you understand it, so make your students do some teaching. For example in lab, if you explain something to one student, the next time someone asks the same question, have the first student answer the question. Check to make sure they are doing a good job answering, and then from then on that student can be the “expert” on that issue.

Getting students to the board: For in-class discussion, it can be helpful to get the students to stand up and draw/write things on the board rather than having you be in the position of authority all the time. If you just ask someone to “get up and draw X” they may feel uncomfortable. An alternative is to say that whoever goes to the board is exempt from having to know what to put on the board. That is, the person who stands up is just the medium, and the rest of the class has to tell them what to do. This makes it a group exercise. Often the person who was shy about standing up at first quickly starts to make their own decisions about what to do anyway.

Preventing students (particularly women) from being secretaries: Lab groups often have one person who takes on the role of recorder or secretary, which prevents that person from doing the hands-on part of the lab. You don't want any particular student to get stuck in this role, and studies show that women in particular tend to take on this role. If you see this happening, remind the group that they need to make sure everyone takes on all the roles at some point, or find some mechanism that requires them to do that.

“Think, pair, share”: pose a question or problem, poll class, if wide disagreement have them turn to their neighbor and discuss, then poll again and discuss as a class.

Provide a potential exam question and several alternative answers, then have students discuss the strengths/weaknesses of each answer. Have them decide how they would grade it and why.

Have the students write their own exam question (either as part of the exam or before-hand). This can provide you with new questions as a side benefit, but if done ahead makes them think (rather than just memorize) and if done in the exam lets them feel they are showing what they know, and makes a non-multiple choice that is generally easier to grade (because they are usually right).

Minute assessments. Short writing assignments such as “What did you learn today? What questions remain?” (these two apparently good together since they can't assess the second without doing the first). Also called “quick-writes” on some websites. Usually these are for check-off credit (don't need to be graded or returned). These are great for getting the students to think a little bit, and for giving you some idea what they are getting/not getting. Also good for filling the last few minutes of class when they aren't paying attention anyway. They work best

when you report back to the class some summary of the answers so they believe you are reading them.

Provide partial outlines of lectures ahead of time, then they fill in the missing things as they go. Helps them follow lecture, but still makes them write. This is particularly helpful with younger, less experienced students who may not know how to take notes.

Network diagrams (also called “concept mapping”). Take a collection of terms (e.g. isolation, effective population size, inbreeding, heterozygosity) and ask them to connect them with causal arrows. This works well as a short in class exercise; give them a couple of minutes to draw their maps, encourage them to work together, then build the map on the board by starting with one word and asking them to shout out connections.

Getting students invested in the course at the beginning. Ask what their goals are. Goals can be skill based (ask what skills they think employers might want?), or particular questions they want answered. Show them what they are interested in (compile the results for them) and discuss how course will address these things. Find some interesting questions among the particular questions they raise and try to answer them as the semester goes by, either when they are relevant, or as breaks from harder material.

Give students some data (e.g. several observations or a graph) and ask them to draw a conclusion, state what additional data they need, etc. This can be done in short think/pair/share mode.

Pause procedure. Stop every 15 minutes of lecture and take time for a minute assessment or some kind of quick discussion.

Use powerpoint in stages (“striptease”) to develop ideas slowly, let students think. Do this by starting with a slide with only partial information, followed by slides that add on (e.g. don’t list all your points on one outline slide).

Record results of in class discussion (on the board or on paper or on a laptop) and then post on line for students to refer to.

3. A few resources

Classroom Assessment Techniques, A Handbook for College Teachers by Thomas A. Angelo and K. Patricia Cross, Second Edition, San Francisco, Jossey-Bass Inc., Publishers, 1993. See this website for a summary of what these techniques are and some descriptions of particular techniques: <http://cft.vanderbilt.edu/teaching-guides/assessment/cats/>

Collaborative learning website: <http://www.wcer.wisc.edu/archive/cl1/CL/default.asp>, including some stuff about grading but also about choosing groups, kinds of assignments, etc. Also good general suggestions for active learning.

Free software that students can use to make concept maps on their computers:

<http://cmap.ihmc.us/>

American Biology Teacher (peer-reviewed journal of biology education):

<http://www.nabt.org/websites/institution/index.php?p=26>

The Ecological Society of America education section website:

http://www.esa.org/esa/?page_id=801. This site has lots of resources, including instructions and materials for labs and in-class exercises, a clearinghouse for educational materials for ecology, and the newsletter of the education section.