

TA/TF TRAINING, LECTURE 1:

PRESENTATION SKILLS, CLASSROOM DYNAMICS, AND RELATED ISSUES.

Introduction

1. Who was your best professor when you were an undergraduate? Why?
2. Who was your worst professor? Why?

I. PRESENTATION SKILLS

A. Boardwork

1. Most instructors underestimate the importance of neat and clear boardwork. (Which instructor gets better evaluations? Entertaining Mr. Personality with unclear handwriting or meticulous Mr. Boring? From which instructor do students learn more?)
2. Do not be pressured by time into sloppy, hurried boardwork. If you are neat and organized, you will end up writing less and SAVING time.
3. After you've finished writing, your students should be able to take a photograph of the board and use that for their notes.
4. After each class period, stand back and LOOK at your board. Is everything written out clearly? Are comments distinguished from examples distinguished from theory? When you answered a question off to the side, did you include the question? The conclusion?
5. Everything you write on the board is for the student to copy and decipher LATER, without commentary from you. Those arrows and squiggles are meaningless three weeks after the lecture.
6. Write clearly: handwriting counts. Use all capital block letters if necessary.
7. Write horizontally.
8. Do not erase the board until the *whole* board is full.
9. Make sure your handwriting is not too small (ask your students).
10. Use the WHOLE board. Be careful about using portions of the board that are not visible to everyone in the class:
 - (a) The bottom of a board in a very full class,
 - (b) Far ends of the board when there are obstructions in the classroom (TVs, pillars, computer monitors, etc.).
11. Use the available board space wisely.
 - (a) Begin at the upper left hand corner and work your way across and down (newer TAs/TFs often have trouble with this).
 - (b) Don't jump around the board.
 - (c) Draw vertical lines to partition the board into panels.
 - (d) Draw a horizontal line after each example, proof, idea, section, etc.
 - (e) Be careful if the chalkboard is divided.
 - (f) Discussion: what if you run out of board during a long example?
12. Step out of the way on a regular basis.
 - (a) This can be a good opportunity to pause.
 - (b) This gives your students a chance to catch up.
 - (c) This gives you a chance to emphasize a crucial point.
13. Typos: Always *thank* your audience member for pointing out a typo and then correct your board, even if the correction seems silly to you.

Example: f versus $f(x)$, minus instead of plus, x instead of z , etc.
14. With rare exceptions, make sure that everything you write on the board is correct. (Don't write $\sqrt{x+y} = \sqrt{x} + \sqrt{y}$ and then *say* "This is false." (Cross it out or write FALSE in big letters.))

15. When you correct a mistake on the board, either cross it out, or erase the mistake and replace it by a correction. But if you erase, you should always underline or circle the correction, and write “correction” on the side. Why is this so important?
 16. Use subheadings, boxes, and underlining to help important material stand out.
 - (a) Chapter and section numbers and titles
 - (b) Definitions
 - (c) Theorems
 - (d) Proofs
 - (e) Examples
 - (f) Solutions
 - (g) “Dangerous curves”, “Watch Out”, “Key Idea”, “Motivation”
 - (h) Anything else?
 17. When working problems, be sure to write the problem clearly, including the TASK.
 - Don’t just write, “ $3x + 7 < 2$ ”; Instead, write “Find x so that $3x + 7 < 2$.”
 - Don’t just write, “ $f(x) = 17x^3 - \sqrt{x}$ ”; Instead, write “ $f(x) = 17x^3 - \sqrt{x}$, find $f'(x)$.”
 18. If a certain formula will be used repeatedly, preserve it (in color?) on the extreme left or right side of the board.
 19. Use color to graph, distinguish, direct attention, and emphasize important points.
- B. Speech
1. Speak clearly. Non-native speakers may need to put extra space in between words.

Example: Lecturing in Glasgow
 2. Speak at the appropriate volume.
 - (a) Project your voice. The students at the back of the class should be able to hear and understand every word.
 - (b) Repeat each question you are asked.
 - (c) When talking and writing simultaneously, speak up. Your voice doesn’t bounce well off the black board.
 3. Monitor the rate at which you speak. Most people speak faster than usual when nervous. So monitor your level of anxiety and compensate for it by speaking at a controlled rate. Non-native speakers sometimes speak too quickly.
 4. Use the correct level of exposition.
 - (a) Your main objective is to convey, with clarity, the important features of the topic you are presenting.
 - (b) Resist the urge to “awe” your students with your intellect.
 - (c) Resist the urge to “baby” your students.
 5. Pause regularly (frequently) during your presentation.
 - (a) This gives students a chance to catch up.
 - (b) This allows students time to formulate questions.
 - (c) It gives you an opportunity to repeat and reinforce important points.
 - (d) But don’t be quiet for *too* long.

Example: 1650 TA
 6. Other issues? Discuss.
- C. Eye Contact. **Note:** *This is an area of consistent difficulty for TAs and TFs.*
1. Make as much eye contact as possible. In particular, don’t spend your all of your class time talking to the board.
 2. Try to look at everyone on the class during the course of your presentations.

- (a) Don't reserve your eye contact for the person who asked the question (with obvious exceptions).
 - (b) When you explain a problem or policy, explain it to everyone (by making eye contact).
 - (c) Everyone tends to favor one side of the classroom. Make sure you spread your eye contact around. One strategy: choose a student in each corner of the room and be sure to make eye contact with that student (then his/her neighbors) each time you look at the class.
3. Don't just survey the classroom: monitor the body language of your students.
 - (a) If everyone looks baffled, they probably are.
 - (b) One suggestion: choose four students of different abilities and watch their body language closely.
 - (c) Be prepared to respond to confused looks with a better, different, or more detailed explanation.
 - (d) Reading body language comes with experience, especially when simultaneously lecturing and thinking about the next topic.

D. Time

1. There is **absolutely, positively no excuse** for walking into class after your class is supposed to start. Students are paying good money for your services.
2. Get to class with a few minutes to spare. This gives you a chance to scan your notes one last time and to answer questions.
3. Don't be afraid to tell a student "We must begin class now; we will finish this discussion after class (or in office hours)." (Especially the first day of class when students have individual problems with enrolling or meeting prerequisites.)
4. Whenever you find yourself involved in a time consuming or unpleasant discussion, consider post-ponement. (This gives you time to cool off and plan your policy carefully.) Just say, "We need to move on, please talk to me after class about this issue", "Let me consider your concerns and get back to you next class period", "Your question is very interesting, but outside the scope of today's lecture; let's discuss it during office hours".
5. Use the computer monitor (preferred — why?) or your watch to monitor the time.
6. Don't go long. Students will resent you more than you think.

Example: Physics 53 TA

7. Don't go short.
 - (a) Use the entire class period. Don't cut class short the first day (review instead).
 - (b) Do not tolerate students who close notebooks, zip bags, etc. in anticipation of the end of class. This will not be problematic if you develop a reputation of ending on time. Announce "Class is NOT over, we still have 5 minutes", or ask humorously "Going Anywhere?".
 - (c) Make sure you have more than enough material for your class.
 - (d) In certain circumstances, it's OK to go a bit short. For example, you may have 4 minutes left, which is just not enough time to introduce the next topic.
 - (e) Avoiding awkward cut-offs comes with experience.

E. Hand Motions

1. Hand motions can often enhance teaching, but aren't necessary.
2. If you find yourself naturally using hand motions, always remember that your audience's left and right are your right and left, respectively.

Example: from $-\infty$ to ∞ , clockwise versus counterclockwise...

II. CLASSROOM DYNAMICS

A. Student Involvement

1. Get your students involved from the beginning.
 - (a) Involve them in lecture. Encourage questions and comments.
 - (b) Involvement is especially important during problem solving and recitation.
 - (c) Be clear about your expectations for their involvement. How do you *discourage* inappropriate discussion?

Example: "Three strikes and you are out..." (for know-it-alls)

- (d) Ask your students "why".

Example: Why does $A = \pi r^2$?
- (e) Your students may suggest the correct approach without any concept of why it is correct. Discuss the deeper mathematics behind learned techniques, but don't overwhelm students with theory in lower-level courses. (Focus on illuminating examples instead.)

Example: Visiting faculty teaching complex numbers.

2. **Get creative** when involving your students. For example:
 - (a) Bring props (umbrellas, sticks, blocks, disks, spheres, etc.).
 - (b) You are running a *problem-solving session* over material with which your students are clearly struggling. There are absolutely no questions. What do you do?
 - (c) You just finished *lecturing* over a topic and everyone looks as though they are about to faint. You ask if there are any questions — and it is dead quiet. What do you do?

Example: Riemann sums, waterguns, shouting.

- (d) Be careful about presenting too many alternate explanations at once — that's like getting 20 alternate routes to a new restaurant, guaranteeing that you'll get lost.

B. Encouraging questions

1. **No question is a dumb question.** Always AFFIRM the question poser: "Thanks for clearing that up", "Excellent question", "You raise an interesting point". You encourage questions and establish a friendly, healthy atmosphere in class with this policy.
2. Another reason to affirm every question: you avoid mistaking an intelligent comment for a silly question. Often, a student wants to make a subtle and important point, but you brush the student off (because you are tired, or stressed, or irritated, or hurried?) and don't recognize the student's attempt.

Example: "Is 3 times 3 equal to 9? Yes, yes, it is... oh, I have a typo on the board, that integral should be a derivative! Oh, and you are pointing out the answer is 9 by a theorem in complex analysis?"

3. Learn the fine art of turning a "dumb question" into a "smart question".

Example: "Is 3 times 3 equal to 9? Yes, it is, and you raise an excellent point: multiplying correctly is crucial to the technique we are now learning."
4. Be sure to pause on a regular basis throughout your presentation to give your students opportunities to ask questions.
5. Be prepared to draw your students out. DON'T CUT OFF THE QUESTION POSER before he/she has finished asking the question. Let the other students hear the question to the end. It sometimes takes time for students to formulate a question. Be patient and encouraging when this happens. Don't RUSH the question poser!
6. Foster an atmosphere that welcomes and encourages questions.
 - (a) Never make fun of a question—neither actively nor passively.
 - (b) What mistakes can you make as an instructor to *discourage* questions?
7. Note that not all questions promote a healthy classroom environment. Have responses ready to these common questions:
 - (a) "Why do we have to know this?"

(b) “Is this going to be on the test?”

(c) “What good is this?”

Example: Be careful; Not every question of this type is asked with snide undertones. What would you answer if a student sincerely asks in class what good raising something to the $2/5$ power is?

(d) “Why can’t we just do it this way....?” (using formulae or techniques not yet developed)

C. Classroom Management

1. You owe it to your students to maintain proper control of the class.
2. It is critical to deal with disruptive behavior and disgruntled students immediately, before things escalate. If you don’t address disruptions, you will be stuck with a very difficult classroom atmosphere interfering with learning and teaching.
3. Some classical examples are as follows:
 - (a) The “know-it-all” (monopolizer of time);
 - (b) The “harumpher”
 - (c) The “evil eye”
 - (d) The “complainer”
 - (e) “Mr. Non-sequiter”
 - (f) The “mocker”
 - (g) The “chatterbox”
 - (h) The “pushy student”
 - (i) The “angry student”
 - (j) Are there others?
4. Most class disruptions arise from
 - (a) testing of your limits and resolve,
 - (b) a genuine concern.
5. When dealing with complaints
 - (a) Echo or determine the student concern. E.g., student complains that no late homework is accepted; you ask sincerely “Are you worried that you may miss an assignment when sick?”
 - (b) Address the underlying concern. E.g., “I understand your concern: the lowest homework score is dropped automatically to address that situation.”
 - (c) Affirm your policy/rule with a firm tone (and some explanation). E.g. “The grader is on a strict schedule, we just can not accept late homework and get the grades done on time.”
6. Don’t get defensive or upset: that only encourages complaints. (When the students test your authority the first few class meetings, don’t take it personally.) If you address each complaint in a firm and matter-of-fact manner, the students tire of challenging you.
7. Try to turn an enemy into an ally. You can often neutralize a difficult student by simply asking the student’s opinion on some current issue. (If a student wants attention, give him/her attention!) Let the student be the expert on some matter. Single the student out in a positive way right from the beginning. Joke with the student. Often the most disruptive students then become the “life of the party” for the rest of the semester in your class (in a great way).

Example: Turning complaint into “John’s theorem”.
8. Be careful about *embarrassing* a student. This often stops the disruptive behavior temporarily, but a student may seek revenge if truly humiliated. Also, you scare the other students.
9. Appeal to students’ integrity (with humor).

Example: I feel your pain... no pain, no gain...

10. Some other strategies for dealing with a difficult student:
 - (a) On a first pass, try to address these issues with the student individually — before or after class. Note that with “the mocker,” you will almost certainly have to address this issue immediately during class time.
 - (b) You may need to give the student a written warning. You can include the “student code of conduct” document.
 - (c) If you are a TA, you may need to have your lecturer speak to the offenders.
 - (d) If this doesn’t solve the problem, refer to the Center for Student Rights and Responsibilities: www.unt.edu/csrr.
 - (e) You may need to involve the Dean of Students.
 - (f) At some point, it may become necessary to file a formal complaint with the Department of Academic Affairs.
11. If *you* handle an issue badly, especially during class, apologize and move on.
12. The extent to which students will try to push you around (or generally take advantage of you) is a function of many variables. Here are a few:
 - (a) The personality of the instructor (e.g. shy).
 - (b) The age, stature, and physical size of the instructor.
 - (c) The gender and language skills of the instructor. A rule-of-thumb pecking order: foreign females, foreign males/US females, US males.

Example: Not always! Mrs. Baghdad versus tall Texan Mr. Bullfrog.
 - (d) The presence or absence of boundaries and *professional distance* (we will discuss this shortly).
13. **If you are having trouble in class, don’t be afraid to ask for help.**

D. Professional Distance

1. *Your students do not need a buddy — they need a professional mathematics instructor. They have paid for your services — remember that fact.*
2. To properly control your class, you will need to establish some distance between yourself and your students.
3. Every instructor, at some level, wants to have a good rapport with his/her students. You have to know and compensate for your “tendencies.” For example, if you have a burning desire to be liked by your students, make sure you invest energy establishing a professional relationship with them (e.g. expecting respect, not chumming around with them). What if you tend toward strictness and distance?
4. Especially if you are a TA:
 - (a) You stand, in some sense, between your students and the lecturer.
 - (b) Be careful about playing yourself off *against* your lecturer — even if he/she is a goof.
 - (c) **Remember:** The lecturer/TA relationship can have a profound effect on the way a class plays out.
5. Your appearance matters. In particular,
 - (a) It should **not** be a distraction.
 - (b) It can be a tool for increasing your professional distance.
6. Be careful about assuming the role of “counselor.”
7. Do not put yourself in situations that have even the appearance of unseemliness. Examples:
 - (a) Avoid off color comments, especially in class.
 - (b) Avoid private meetings with students with your door closed.

- (c) Be careful about after-hour meetings with students, especially with those of the opposite sex.

Example: Jim McDonald's colleague at OSU

- (d) Avoid meeting students in places other than your office (e.g. the union, library, a bar, restaurant, etc.).
- (e) Do not become personally involved with your students in any way, especially romantically! Do not date students.

Example: "I would do anything to pass this class..."

8. Remember you are working at a PUBLIC university.
 - (a) As a public employee, be very careful about sharing personal religious beliefs.
 - (b) Do not post anything on your door, webpage, or office referring to religious beliefs.
 - (c) Although Christianity seems to be the dominant religion on campus, some of your students will be Muslim, Jewish, Buddhist, etc.
 - (d) If you are religious, avoid the temptation to speak about a "higher being" in general — you may hope to appeal to students of other religions, but some students will be atheist, and they will resent this.
 - (e) Students may be quick to judge you, or feel judged *by* you. If the subject of religion comes up in your class, be sure that no students feel excluded, judged, advantaged, or distanced by your remarks.
 - (f) Same ideas applies to sensitive political issues (gender, race, homosexuality, etc.). Your job is to maintain an INCLUSIVE atmosphere in the classroom.
9. Establish **boundaries**.
 - (a) Be careful about holding too many office hours.
 - (b) It is easy to be swept away by the urgency of your duties, especially regarding to the needs of individual students.
 - (c) Learn to say NO.
 - (d) Remember that you are a student. Your own course work is crucial.
 - (e) You may need to throw people out of your office (outside of your announced office hours) if you need to get to work.
 - (f) One suggestion: set your office hours to run up against natural "hard boundaries," like your classes, so that you have a good excuse for leaving immediately at the end of office hours.
 - (g) If you can't see a student who drops by, make sure that you set an appointment.
 - (h) Many instructors welcome drop-ins. This makes students happy, and (in my experience) rarely does anyone abuse this policy.
 - (i) If you tend to be overwhelmed by drop-ins, consider sticking to the rule that students **MUST** make an appointment to see you outside of office hours.

Example: RJ's tough love: block the entrance with calender in hand!

10. There will be students who rub you the wrong way. It is crucial to avoid favoritism, especially regarding policies and grading.
 - (a) Make certain that your general policies, in both statement and practice, do not depend on whether or not you like an individual student.
 - (b) Your grading policy should be "blind"; we'll discuss methods of implementing this later.
 - (c) Your appointment flexibility should be "blind."