Advice for (New) TAs

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Survey

• How many of you are TAs?
• How many of you have never taught before?
  – You have taught if you’ve ever helped anyone with HW
    • But not cheating!
      – Giving/telling someone the answers is not teaching!
• How many of you will never teach again after you get your degree?
  – You will eventually teach!
    • If not as a TA, then at your job:
      – Talking to your boss about your work
      – Making oral presentations to colleagues
Today’s Topics

1. General advice for (non-American) TAs

2. 10 Commandments of Good Teaching

3. 4 Approaches to Successful Learning
1. General Advice for (non-American) TAs
American Students vs. Non-American TAs

• American students tend to be:
  – Informal
  – (something else that can’t be printed)

• There are language differences:
  – What are the answers to these simple math problems?
    • 5 into 10 =
    • 10 by 5 =
  – Who “takes” a course?
  – Who “gives” an exam?
  – Where is my “seat”?
American Students vs. Non-American TAs

• There are language differences
  – E.g.: What are the answers to these simple math problems?
    • $5 \text{ into } 10 = 10/5 = 2$ [NOT: $5 \times 10 = 50$]  5 divided into 10
    • $10 \text{ by } 5 = 10 \times 5 = 50$ [NOT: $10 \times 5 = 2$]  10 multiplied by 5

  – Who “takes” a course?
    • Students take courses. Faculty teach courses.

  – Who “gives” an exam?
    • Faculty give exams. Students take exams.

  – Where is my “seat”?
    • My office is in Bell 214. I have a seat (better: a chair) in my office.
    • (And my pants have a “seat” :-)


American Students vs. Non-American TAs

• Gesture differences
  – E.g., what does it mean when I shake my head from side to side?

• Name differences
  – “first name” vs. “last name” (given name vs. family name)
Required Reading
(see handouts)

• Reznick, Bruce A. (1985),
  “Chalking It Up: Advice to a New TA”

• Cohen, Robby, & Robin, Ron (eds.) (1985),
  “Teaching at Berkeley: A Guide for Foreign
  Teaching Assistants”

• Both from:
  Case, Bettye Anne (ed.) (1989),
  Keys to Improved Instruction by TAs & Part-Time
  Instructors (MAA Notes #11)
Website:
“Advice for Teaching Assistants”

- http://www.cse.buffalo.edu/~rapaport/TA/cse501.html

- Username = Bill
- Password = Rapaport
2.

Bill Rapaport’s Version of Kip Herreid’s*

10 Commandments**

of Good Teaching

*Clyde F. Herried
Distinguished Teaching Professor
Department of Biological Sciences

**Laws given to Moses by God, according to the Bible
I. **Golden Rule of Teaching:**
Teach unto others as you would have others teach unto you.

- Care about your students
- Care about your message
- All else follows from the Golden Rule
- Remember yourself as a student
  - Imagine yourself in your own classroom!
- Remember your good teachers
  - Do what they did
- Remember your bad teachers
  - Don’t do what they did! 😊
II. Thou shalt organize & prepare thy lessons.

- Establish a theme for your lecture
  - Research it, organize it, show the organization

- You need to be:
  - Researcher, scriptwriter, editor, director, & actor

- Interest curves: Don’t present topics randomly
  - Avg. lecture, nightclub, playwright

- Don’t just “wing it”:
  - *act as if* you’re completely in control.
Generic Recitation-Section Lesson Plan

1. Take attendance.
2. Collect HW (if any; unless done in lecture)
3. Ask if any questions on HW (maybe do before 2).
4. Review difficult topics
   a) Ask if any questions on lecture material
   b) NB: This is easier to do if you attend lectures yourself!
5. If time remains (in no particular order):
   a) Give hints on programming projects (if appropriate)
   b) Do other exercises from text that were not assigned as HW
   c) Do other exercises from instructor’s manual
   d) Give a 5-minute quiz, & go over in class
      • Could be a surprise quiz; use to replace low HW grade
6. Overprepare! Always have something “up your sleeve”
   • Don’t be caught thinking “What should we do now?”
   • Students’ answer: “Dismiss us!”
III. Thou shalt practice.

• Real practice
  – Not OK: just 10 minutes before
  – Better: at least ½ hour prior to presentation
  – Best: 1 hr. prep for 1 hr. lecture
    • During rehearsal, do everything you’d do in class
      – Draw graphs, show overheads, etc.

• Avoids embarrassing lapses.

• Frees you to improvise if needed.
IV. Thou shalt create excitement; thou shalt not be boring.

• Any subject can be made interesting; ∴ any subject can be made boring (H. Belloc)
• Be charismatic
  – Say interesting things
  – Don’t be laid back; be involved
• Students can tolerate anything except boredom
• Don’t make your students like your subject less
• Use personal experiences, (short) stories, quotations, repetition, theatrical techniques
V. Thou shalt speak clearly & distinctly, with variety

• Don’t face the board unless you speak louder.
• Speak to the students
  – Look each student in the eye
  – Talk 1-1 from time to time
    • But then draw back & include everyone
• Use voice inflection
  – Act like you care about your topic
V. Thou shalt speak clearly & distinctly, with variety (continued)

• Use vocal variety
  – Gradually louder & quicker, or slower & quieter
  – Use a microphone in large rooms

• Trained speakers can make nonsense sound wise.
∴ don’t make your wisdom sound like nonsense!

• V.a. Thou shalt repeat students’ questions before answering them!
  – V.a.1. And thou shalt answer the questions for the whole class to hear.
    • I.e., turn your answer into a mini-lecture
VI. Thou shalt not pace, but move with style and grace

- Gives variety; conveys meaning
  - Don’t stand like an immovable statue in front of the overhead projector or computer.
- Don’t look clumsy:
  - Don’t face straight on; put 1 foot forward
- Really important stuff should be said front & center, close to audience
  - At board is weak
- Which side of room is better?
  - (answer on next slide 😊)
VI. Thou shalt not pace, but move with style & grace (continued)

• Which side is better?
  – On neutral stage, audience-left is stronger
    • Actors enter audience-left; exit audience-right
  – Something interesting or confusing to look at (e.g., window) can change audience preference
  – Weakest place:
    • Audience-right, back in a corner

• Talk in non-normal or novel places
  – Side of room
  – Aisle
VII. Thou shalt use examples.

• For each principle, give an example
  – No matter how obvious the principle might be

• Better:
  – give examples,
  – then the principle,
  – then more examples.
VIII. Thou shalt use demonstrations.

• For each principle, give a demo
  – Prepare the demo ahead of time!
• Bring things in for “show & tell”
• I hear, & I forget;
  I see, & I remember;
I do, & I understand
IX. Thou shalt use analogies.

• For each principle, give an analogy
• Use the familiar to explain the unfamiliar
• E.g.:
  – Call by value = making a Xerox copy
  – Call by reference = sharing a box of candy
X. Thou shalt be creative.

- Be alert to novel ideas
- Visit colleagues’ classrooms
- Take risks
  - Do things with confidence
    - Even if it’s corny or contrived (“hokey”)
- Don’t hesitate to steal good ideas!
  - X.a. Thou shalt covet thy neighbor’s ideas!
3. William Perry’s Theory of Approaches to Successful Learning
4 Approaches to Successful Learning

• All 4 used by everyone
  – At different times in life
  – In different areas of life
  – Sometimes simultaneously

• Some are more appropriate for some people in some circumstances

• Identifying a student’s approach can help you to help the student
1. Dualism

A. Basic Dualism:
- All problems are solvable
  - Solutions on Golden Tablets in sky
  - Only Authorities (= teachers) have access
- Student’s task = to learn right solutions

A. Full Dualism:
- Some authorities (literature, philosophy) disagree
- Others (science, math) agree
  - There are correct solutions
    but some teachers’ views are obscured
- Student’s task = to learn right solutions
  - And ignore others?
For dualistic students …

• Instructor:
  – Seen as the only legitimate source of knowledge

• Themselves:
  – Seen as receivers & demonstrators of knowledge

• Other students:
  – Not seen as legitimate sources of knowledge

• On evaluation:
  – Wrong answer = bad person
  – Evaluation should be clear-cut

• Support:
  – Need high degree of structure
    • Dualistic students like lectures, hate seminars
Voices of Dualism

• Cornell undergrad (NY Times):
  – “Every lecture course, no matter how bad, has taught me more than any seminar, no matter how good. In a lecture, you get taught by an expert, which means the information is credible. But in a seminar, most of the information is from other students like yourself, which leads to discussion that is irrelevant & suspect in accuracy. [In seminars,] profs don’t like to tell students directly that they are ‘wrong,’ [or] ‘correct,’ so one can leave a seminar confused & not knowing any more than when one entered.”
Voices of Dualism (continued)

• “I’m lost in CS 341 [computer architecture]; the professor lacks a clue.”

  – I.e., it’s the prof’s fault; he’s the Authority
Are Math/Science/Engineering Dualistic?

- Leon Henkin (math, UC/Berkeley): NO!
  - “One of the big misapprehensions about math that we perpetrate in our classrooms is that the teacher always seems to know the answer to any problem that is discussed.
  - “This gives students the idea that there is a book somewhere with all the right answers to all of the interesting questions, & that teachers know those answers, & if one could get hold of the book, one would have everything settled.
  - “That’s so unlike the true nature of math”
    - Or science, or engineering, or computer science!
2. Early Multiplicity

• There are 2 kinds of problems:
  – With solutions that we know
  – With solutions that we don’t know yet

• Most knowledge is known.
  – There are right/wrong ways to find answers to the other questions.

• Student’s task =
  to learn right ways to find correct solutions
For early multiplists …

• Instructor:
  – Seen as source of right way to get knowledge

• Themselves:
  – Seen as learning how to learn
  – Seen as working hard

• Other students:
  – Seen as in the same boat / ∴ OK

• On evaluation:
  – Of central concern
  – Quantity of work counts
  – Fairness is important

• Support:
  – from peers, some structure
3. Late Multiplicity

a)  Less cynical form:
   • Most problems have no *known* solution
   \[\therefore \text{ Everyone has a right to their own opinion}\]

a)  More cynical form:
   • Some problems are *unsolvable*
   \[\therefore \text{ doesn’t matter which (if any) solution you choose}\]
   • Student’s task = to B.S.
   • Most freshmen?
Late Multiplists …

• Instructor:
  – Seen as source of the thinking process,
  – Or else (cynical form) seen as irrelevant
    • everyone’s entitled to own opinion

• Themselves:
  – Seen as learning to think for themselves
  – Seen as expressing opinions
    • whether believed/supported or not

• Other students: Seen as legitimate (but: )

• On evaluation:
  – Independent thought deserves good grades…
  – Or (cynical form): “I’ll do what they want”

• Get support from: diversity; lack of structure
  – Late multiplists hate lectures, like seminars
Voices of Dualism Confronted with Multiplism

“I really enjoyed this course. I had lots of trouble till about 2/3 into the course, because I was looking for answers. Once I realized there were no answers & you had to figure things out for yourself, it became easier.”
“TAs should use the Prof’s method of solving problems rather than using their own which confuse us more but if the method is simpler & easier to understand, then it’s OK, I guess, to introduce their own method of solving.”
Voices of Multiplism

“You know, it seems to me that there are 2 different kinds of things we study—things where there are answers & things where there aren’t any!”
Voices of Multiplicity (continued):

“There are many of us students who spend from 3–9 hours working on one lab assignment. When we get our grades back, they don’t meet our satisfaction. I spend a lot of time thinking, & trying out my program. When I get a D, I get upset. Maybe the grade should include more effort than if the program runs properly.”
Voices of Multiplism (continued)

• “I attend recitation to hopefully gain some information I did not catch or understand in class. Regretfully I learn more on my own time than in recitation…
  – Early multiplism \(\rightarrow\) late multiplism

• “…I like that there are many ways to solve or code a program…”
  – Late multiplism

• “I feel like I’m programmed to program—not learning how & why. Why does everyone else get it? I feel stupid.”
  – Late multiplism? Dislike of dualism!
4. Contextual Relativism

• All proposed solutions must be supported by reasons
  – I.e., they must be viewed in context and relative to their support
• Within a context, there are:
  – Right/wrong (better/worse) answers
  – Rules for good thinking
• Student’s task = to learn to evaluate solutions
• Where we’d like most students to be.
Contextual relativists …

• Instructors:
  – Seen as source of expertise …
  – as long as they follow contextual rules for good thinking

• Themselves:
  – Seen as studying different contexts
  – Seeing different perspectives

• Other students:
  – Legitimate if they follow contextual rules for good thinking

• On evaluation:
  – Evaluation of work ≠ evaluation of self
  – Evaluation is part of learning

• Get support from:
  – Instructor
  – Diversity
Voice of Multiplism Confronted with Contextual Relativism

• CS junior/senior in CSE 191:
  – “Since the material tends to be subjective, it helps to see the reasoning of another person sometimes.”
Voices of Contextual Relativism

• Cliff Stoll @ UB:
  – “The answer is Markus Hess; now go home. If you’re only interested in the solution, leave. If you’re interested in good science & want to know how I solved the puzzle, stay.”

• Gauss (1808):
  – “It is not knowledge, but the act of learning, not possession but the act of getting there, which grants the greatest enjoyment.”

• Einstein:
  – “The search for truth is more precious than its possession.”
Students Make Their Own Meaning: What Teachers Say vs. What Students Hear

• **Teacher:**
  – Today we’ll discuss 3 algorithms for computing GCD

• **Dualist:**
  – Which is the correct one?
  – Why bother with the wrong ones?

• **Multiplist:**
  – Only 3? Heck, I can think of a dozen!

• **Contextual relativist:**
  – What principles underlie the 3 algorithms?
  – Which is the most efficient?
  – Which should I use on my project?
Your Goals as Teacher

• To **challenge** students,
  – So that they will move from dualism to multiplism to contextual relativism (& beyond)

• To **support** students,
  – As they move from the “comfort” of one approach to the strangeness of another
Examples

- CSE 113/115
  - Different algorithms for same HW can all be “correct”
    - More efficient, more readable, etc.
  - Quantity of effort, length of program are irrelevant (to the grade)
    - Possible solution: bug report

- CSE 191, etc.
  - Proofs: relative truth

- Any course:
  - “How long should the paper/documentation be?”
  - Dualistic question!
  
  \[ \therefore \text{Give a justified length} \]
  
  challenge support
Beyond the 4 Approaches

6. Pre-Commitment:
   • Student sees necessity of:
     – Making choices
     – Committing to a solution

7. Commitment:
   • Student makes a choice (e.g., chooses thesis topic)

8. Challenges to Commitment:
   • Student experiences implications of choice
   • Student explores issues of responsibility
     – E.g., write & defend dissertation
On responsibility of commitment:

• R.W. Hamming (CS):
  – “In science and mathematics, we do not appeal to authority, but rather you are responsible for what you believe.”
9. **Student realizes commitment is an ongoing, unfolding, evolving activity**

- E.g., you become a researcher
- John A. Wheeler (physicist):
  - “We live on an island of knowledge surrounded by a sea of ignorance. As our island of knowledge grows, so does the shore of our ignorance.”

- These 9 “Perry positions” are sometimes repeated!
Go forth and teach well!

(but don’t forget to study hard!)