

Advice for (New) TAs

20060920

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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 into 10 = $10/5 = 2$ [NOT: $5 \times 10 = 50$] 5 divided into 10
 - 10 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

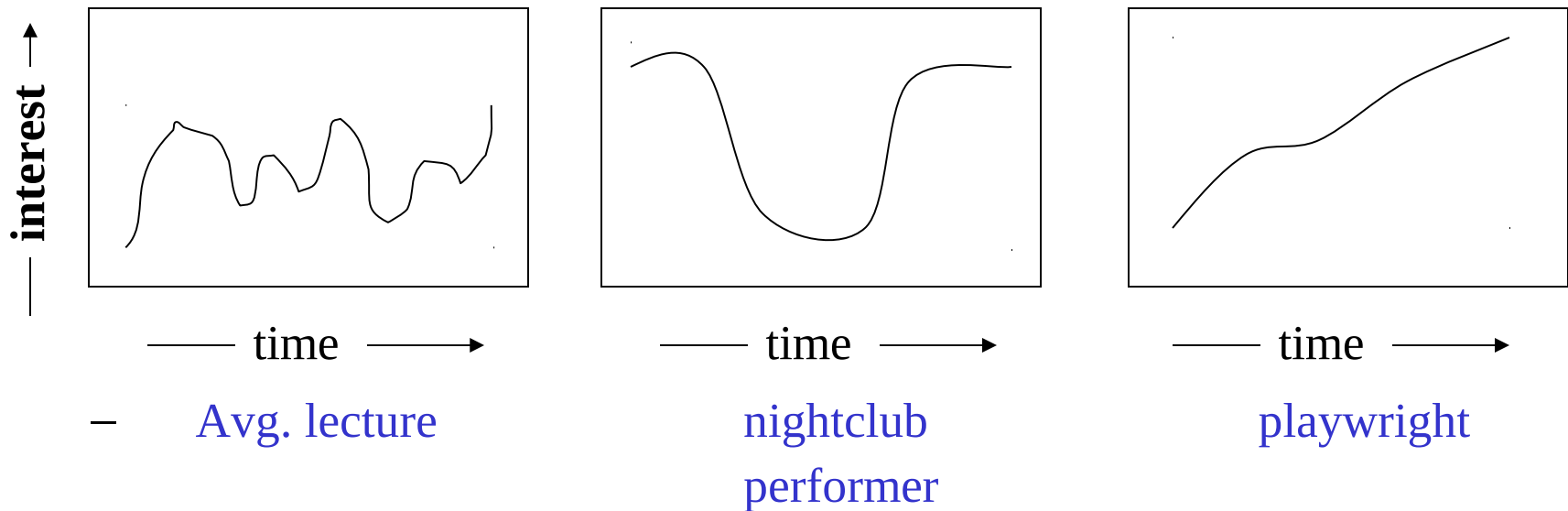
**Laws given to Moses by God,
according to the Bible

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



- 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 $\frac{1}{2}$ 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 \therefore OK
- On evaluation:
 - Of central concern
 - Quantity of work counts
 - Fairness is important
- Support:
 - from peers, some structure

3. Late Multiplicity

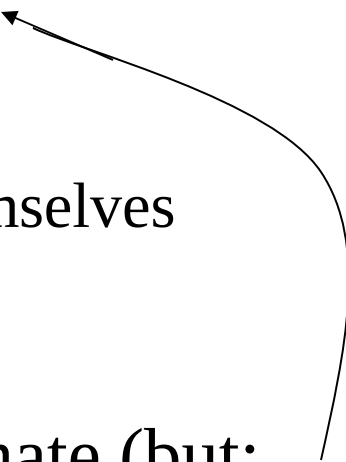
a) Less cynical form:

- Most problems have no **known** solution
- ∴ Everyone has a right to their own opinion

a) More cynical form:

- Some problems are **unsolvable**
- ∴ 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.”

Voices of Dualism confronted with Multiplism (continued):

“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 Multiplism (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 → 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 \neq 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!
 - ∴ 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!)