Learning to Teach:

A Workbook for Graduate Students

in Biology

Fall 2003

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A Note to the Graduate Student

Objectives

The purpose of this workshop and workbook is to help you to become an effective and efficient teacher. In this course, I will define a good teacher as someone who mentally prepares, physically prepares, and assesses their teaching with an open mind. I believe that the best way to become a better teacher is to practice teaching and to get feedback on your teaching. Therefore, many activities in this workshop will involve analyzing what good and bad teachers do as well as making you aware of your performance in the classroom. We will have several opportunities throughout this semester to help you analyze your performances as a teacher including discussions, written assignments, and peer classroom evaluations.

This workshop also is intended to provide you with some background in pedagogy to help you understand what teaching and learning are. We will elucidate some teaching tools, including effective grading techniques and active learning strategies. Some of these tools may not be appropriate for your present teaching situation, but they should be useful at some point during your teaching career. Every student appreciates a teacher who can provide a variety of instructional techniques.

A final goal of this workshop is to provide professional development. If you are a first-time teacher, you may not realize that the skills you learn to use as a teacher can be transferred to any job, including non-academic jobs. Inevitably, everyone has to give a presentation, explain how to use a piece of equipment, or critique a paper. Towards the end of the semester, we will highlight some of the skills you have learned or improved upon as a teacher to show how you can market these skills to potential employers.

Assignments and Activities

For scientists participating in this workshop, it may be tempting to believe that some of the in-class activities and homework assignments are not analytical enough to be effective tools for learning about teaching. The assignments are not intended to be mind-bending, cathartic or time-consuming. The purpose of these activities is to help you analyze your development as a teacher and to make you aware of your attitudes towards teaching and learning.

Final Words

Teaching is not easy. However, seasoned teachers will tell you that it is much easier to teach well than to teach poorly. I believe it is also much more rewarding to be a good teacher. Besides the feeling of accomplishment, nothing beats the look of sudden comprehension on a student's face (think "a-ha") or when a student says thank you. I hope that your first teaching experience is an enjoyable one and that this workbook will be useful to you, either in the present or in your future endeavors.

About the Author

Katherine Kearns received a B.S. in Biology with a concentration in Ecology from Cornell University in 1995. She received her Ph.D. in Ecology from the University of Georgia in 2000. During all four years as a graduate student, Katie taught freshman biology laboratories as well as senior-level population ecology laboratories. While at UGA, Katie also had the opportunity to lecture in the Summer 2000 course Introductory Biology for Non-Majors. In addition to her experience as a teacher, Katie was also involved in Teaching Assistant mentoring and professional development at UGA for two years through the Office of Instructional Support and Development.

Katie is currently an instructor and laboratory coordinator in the Introductory Biology Program in the Biology Department at Boston University, where she has taught for nearly three years. Besides taking on initiatives in curriculum development in introductory biology labs, she is also involved in teaching assistant/teaching fellow training with BU's Center for Excellence in Teaching. This workshop and workbook stemmed from an interest sparked at UGA in TA resources and professional development.

Katie's contact information is given below:

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Acknowledgements

In my journey toward improving graduate-student teaching, I have discovered that finding a good mentor is the key to getting projects accomplished. I have been fortunate to have the opportunity to work with two people who have significantly fostered my desire to improve undergraduate education through mentoring graduate-student teaching. I would never have discovered this path without the assistance and support of the Office of Instructional Support and Development (OISD) at the University of Georgia. In particular, I would like to thank Dr. Kathleen Smith, Director of TA Programs at OISD. Her guidance has helped many graduate students develop a passion for good teaching and mentoring. I would also like to thank Dr. Sharon Prado at the Center for Excellence in Teaching at Boston University for our many conversations about improving graduate student teaching in the Biology Department. Finally, I would like to thank the faculty of the Biology Department at Boston University for supporting my "Learning to Teach" course and for allowing me the time and resources to complete this workbook.

Several print resources have also been very helpful in developing my teaching and mentoring skills. Many of these have been cited in this workbook. I am providing a compiled list here as a resource guide for readers who may want more in-depth reading.

Angelo TA and Cross KP (1993) *Classroom Assessment Techniques: A Handbook for College Teachers*. San Francisco, CA: Jossey-Bass Publishers.

Bolles RN (2000) *What Color is Your Parachute? A Practical Manual for Job-Hunters and Career Changers*. Berkeley, CA: Ten Speed Press.

Davis BG (1993) *Tools for Teaching*. San Francisco: Jossey-Bass Publishers.

McKeachie WJ (1999) *Teaching Tips: Strategies, Research, and Theory for College and University Teachers*. Boston, MA: Houghton Mifflin Company.

Silver HF and Hanson JR (1998) *Learning Styles and Strategies*. Woodbridge, NJ: Thoughtful Education Press.

Walvoord BE and Anderson VJ (1998) *Effective Grading: A Tool for Learning and Assessment*. San Francisco, CA: Jossey-Bass Publishers.

BI 699 Fall 2002
Course Syllabus

Class schedule and associated readings and assignments

Date	Topic and associated readings	Assignments
Thursday Aug 28 1:00-2:15	**Introduction to teaching undergraduates** *Read*: Chapter 1: pp. 1-2 **The habits of an effective speaker** *Read*: Chapter 2: pp. 3-6	• Take Pre-Course Evaluation
Thursday Aug 28 2:30-3:45	**Microteaching**	• Be prepared to give a short five-minute presentation about yourself
Week of Sept 1 Part 1	**What makes an effective teacher?** *Read*: Chapter 3: pp. 7-12	• **Thought Paper #1 due today** (see page 13)
Week of Sept 1 Part 2	**The Mechanics of Running a Class** *Read*: Chapter 4: pp. 15-16 **Active Learning through Case Studies** *Read*: Chapter 5: pp. 17-26	• Bring in an outline today of your talk for your first class. Base this outline on the reading in Chapter 4
week of Sept 15	**The Diversity of Learners** *Read:* Chapter 6: pp. 29-34	• **Thought Paper #2 due today** (see page 27) • Answer pre-class activity questions and take a Learning Styles Inventory before coming to class today
week of Sept 29	**An Introduction to Classroom Assessment** *Read*: Chapter 7: pp. 37-40	• **Thought Paper #3 due today** (see page 35)
week of Oct. 13	**Grading fairly, effectively, and efficiently** *Read*: Chapter 8: pp. 43-50	• Bring in an assignment that you need to grade for your teaching assignment
week of Oct 27	**Academic Honesty at BU** *Read*: Chapter 9: pp. 51-60	• **Thought Paper #4 due today** (see page 61)
week of Nov 10	**Documenting your Professional Life** *Read*: Chapter 11: pp. 71-76	
week of Dec 1	Final Class – evaluations (see page 79)	• **Thought Paper #5 due today** (see page 77)

Assessment Criteria

Attendance and Participation

You should plan to attend every class session, although one absence will be excused during the semester with full attendance and participation credit. For every day of attendance, you will receive 1% toward your final grade. In addition to attending the class, you are expected to contribute to class discussions. You may receive up to 3% for each day toward your final grade. Excellent participation with valuable contributions will earn 3%; good participation with a generally good attitude will earn 2%; average participation will earn 1%; and poor participation will not earn participation points for that day.

Written Assignments

The short written assignments are intended to help you think about and evaluate your own progress as a teacher. There are five written assignments, each of which should be no more than 1-2 double-spaced pages in length. The assignments are weighted equally with a total value of 50% for written work (i.e. each paper is worth 10% of your final grade). Late papers will result in a 1% reduction in your final grade for each day late. Papers over a week late will not be accepted.

Classroom visit evaluations

In order for you to receive low-stress feedback on your teaching performance, we will arrange classroom visits by your peers. You will be paired up with another TF in this program. During the semester, you will visit each other's classroom twice, once near the beginning of the term, and once toward the end of the term. As a visitor to the class, you will be asked to fill out an evaluation of the TFs instructional abilities and I will leave a few minutes of class time for you to discuss your evaluation with your peers. I will ask to see both evaluations at the end of the semester. The quality of your comments on the evaluation will be worth 5% of your final grade. The other 5% will be determined by the grade on the second evaluation, plus 5% for each grade of improvement shown over the previous evaluation. This exercise will count for 10% of your final grade.

Summary of Evaluation Criteria

1) attendance (10%) and participation (30%)
2) completion of five short though papers (10% each, 50% total)
3) peer evaluation of a classroom visit (10%)

BI 699 Pre-Course Evaluation

Code Number:_____

1. Have you ever taught before? Y N

   If yes, how many semesters have you taught? _____

2. Did your undergraduate learning experience involve TFs/TAs? Y N

3. Rate your overall undergraduate experience of your TFs/TAs?

   (excellent) 5 4 3 2 1 (terrible)

4. What was the best part about having a TA?

5. What was the worst part about having a TA?

6. What are your career aspirations? Check all that apply.

   _____ postdoc
   _____ government contractor
   _____ business (e.g. biotech)
   _____ other (please describe)
   _____faculty at primarily research university
   _____ faculty at primarily teaching university
   _____ faculty at teaching & research university
   _____ non-government/non-profit organization

7. The following is a list of skills and topics that will be discussed during this workshop. Please rate the skills as to how important you believe each is to your success **as a teacher**.

Skill	Essential	Important	Neutral	Minor	Irrelevant
Effective public speaking	☐	☐	☐	☐	☐
Maintaining an effective learning environment	☐	☐	☐	☐	☐
Designing interactive learning activities	☐	☐	☐	☐	☐
Relaying information in different ways	☐	☐	☐	☐	☐
Giving meaningful feedback to foster learning	☐	☐	☐	☐	☐
Understanding ethical academic behavior	☐	☐	☐	☐	☐
Managing time	☐	☐	☐	☐	☐
Documenting professional activities	☐	☐	☐	☐	☐

(over please)

8. Rate the skills below as to how important you believe each is to your success **as a graduate student**.

Skill	Essential	Important	Neutral	Minor	Irrelevant
Effective public speaking	☐	☐	☐	☐	☐
Maintaining an effective learning environment	☐	☐	☐	☐	☐
Designing interactive learning activities	☐	☐	☐	☐	☐
Relaying information in different ways	☐	☐	☐	☐	☐
Giving meaningful feedback to foster learning	☐	☐	☐	☐	☐
Understanding ethical academic behavior	☐	☐	☐	☐	☐
Managing time	☐	☐	☐	☐	☐
Documenting professional activities	☐	☐	☐	☐	☐

9. Rate the skills below as to how important you believe each is to your success **in your future career**.

Skill	Essential	Important	Neutral	Minor	Irrelevant
Effective public speaking	☐	☐	☐	☐	☐
Maintaining an effective learning environment	☐	☐	☐	☐	☐
Designing interactive learning activities	☐	☐	☐	☐	☐
Relaying information in different ways	☐	☐	☐	☐	☐
Giving meaningful feedback to foster learning	☐	☐	☐	☐	☐
Understanding ethical academic behavior	☐	☐	☐	☐	☐
Managing time	☐	☐	☐	☐	☐
Documenting professional activities	☐	☐	☐	☐	☐

10. What is your general attitude towards the value of this learning-to-teach workshop?

(Very positive) 5 4 3 2 1 (very negative)

Please briefly describe your response below.

Part I:

Preparing

to Teach

Chapter 1
Three Reasons Why Graduate Students Should Teach

Probably the most immediate reason why you are teaching is that you need the money to remain a full-time graduate student. Obviously this is not a particularly glamorous or noble reason to teach. However, the choice by universities to employ graduate students as teachers is really a wise use of resources. One goal of this course is to help you envision how much you have to gain personally by teaching and how much other people depend upon your talents. Graduate students develop professionally through teaching, and departments and universities benefit from well-trained instructors who can personalize students' educations. Below is a summary of the benefits of using graduate students as teachers, adapted from Marilla Svinicki, "A Dozen Reasons Why We Should Prepare Graduate Students to Teach," The University of Texas at Austin.

For the Graduate Student

The skills you learn as a teacher are transferable skills because they will help you in other academic and professional tasks. All of these transferable skills can really benefit you in the job search, especially if you do a good job highlighting these skills in your resume.

1. Teaching is partly an exercise in *time-management and multi-tasking*. There is grading to be done, emails to be answered, and lessons to be planned and prepared. These teaching duties take time away from your research and your classes, yet you are expected to do them all well.

2. Learning how to prepare a lecture and speak well in a public setting will *build self-confidence*. In your immediate future, this experience will help you give professional presentations at conferences, committee meetings, and qualifying and exit exams. If you intend to remain in academia, you will have an edge on the job market since you will already have lots of practice giving lectures. Even if you do not remain an academic for life, many careers will expect you to give professional presentations.

3. As a teacher, you have experience in *managing other people* through training them to perform tasks and monitoring and assessing their progress.

For the Department

There are many classes in the department where professors need help, whether it is lecture, discussion or laboratory. They simply cannot be in many places at the same time. In addition, there are duties that can be performed well by an educated person with some experience in the professor's field, but these duties do not require an advanced degree. That is why you, the graduate student, have been chosen to teach. The teaching duties might include:

Grading
Setting up a demonstration
Photocopying handouts
Setting up a slide projector every class
Participating in or leading a discussion
Assisting in or leading a laboratory activity or course

Teaching Fellow positions are chosen carefully with respect to a graduate student's prior experience in the field. Typically, you may have at least three to four years of experience in the field over your students in a course. Because of your experience, you can easily impart *enthusiasm* for the field to your students. You may be responsible for the grades of a small subset of the students in the major, possibly 30-50 students. Undergrads in smaller classes taught by graduate students will have more *personal interactions* with people actively working in the field. At the minimum, keeping undergrads in the major keeps money flowing to the department. More globally, you may be personally responsible for leading students to become scientists!

For the University

Students at a large university can become overwhelmed or lost by the size. They become "little fish in a big pond." As a graduate student teaching generally *smaller classes*, you are an important contact point for students and you can make the university feel more tight-knit. In addition, students tend to be more engaged in their coursework if they believe someone is interested in their performance. While students may be intimidated by their professors, student interactions with teaching fellows are common. Therefore, students look up to you, the graduate student. These interactions can greatly improve student satisfaction with the university.

In-Class Discussion

Spend a few minutes answering the following questions. We will then share our responses in a discussion.

1. What is one thing you look forward to in teaching undergraduates?

2. What is one personal trait that you believe will enhance your teaching experience?

3. What is one personal trait you would like to work on for your teaching experience?

Chapter 2
The Habits of an Effective Speaker

Teaching is very much like giving a musical or theatrical performance. Musicians and actors always practice and warm up before going on stage so that they can be heard by the entire audience. Why should teaching be any different? The information you have to share is just as important and interesting as the experiences that musicians and actors share with their audience. The following exercises can help you emotionally prepare for your "performances" and make your performances better. The exercises were adapted from the video by Nancy Houfek (2001) "The Act of Teaching. Part I: Theatre Techniques for Classroom Presentations", Harvard University, Anker Publishing.

Center yourself

The real objective in teaching is the student and getting information to them. So think about the real center of attention: the connection between the information and the student. If you allow yourself to be overcome by stage fright, you have allowed the energy to focus on you instead of the student.

Warm-up your body

All musicians and actors make sure their bodies and instruments/voices are warmed-up before the big performance. So should you. Do stretches before teaching to open up your chest, release tension in your neck, and untie your tongue. We will practice some of these exercises in class.

Rib-cage

With your feet at hip-width, clasp your hands in front of you and bring them over your head. Reach as high as you can over your head and keep this position for about 10 seconds. Then reach over the left side of your body for 10 seconds, then your right side.

Upper chest

With your feet at hip-width, clasp your hands behind you and bring them upward while keeping your body upright. Hold this position and breathe deeply for 10 seconds. Then bend over slowly, continuing to breathe.

Shoulder blades

With your feet at hip-width, clasp your hands in front of you. Straighten your arms. Draw several figure eights with your clasped hands. Then reverse the direction and draw several more figure eights.

Shoulders

Move your shoulders up and down several times, then front and back, then in circles.

Find the focal point of the room

As students seat themselves, find out where the center of the room is. At what location in the room can you easily see all students and be seen and heard by all of the students? Think about not only the angle between you and any students, but also the distance you are from any student. You should try to be equidistant from all students most of the time. If this is not possible, be sure to walk around the room during your class. This is to make sure that all students feel like they have had equal attention from you.

Make eye contact with your audience

You need to establish a connection with all of your students every day. So while it may be unnerving to you at first, each and every day before your class, spend a minute or so looking each student in the eye. This can be while they are walking in and opening their notebooks. An alternative is to greet each person as they walk in the door. Continue to make eye contact throughout the class. Imagine that the only way that information will get to your students is if you look directly at each one of them.

Pay attention to your posture

Keep your arms at your sides. Your arm posture is particularly telling of your attitude towards your students. Arms crossed in front of you means you are trying to protect yourself from your audience. Arms behind your back or hands in your pockets means you are hiding something from your audience.

Plant your feet firmly on the floor. Put your weight evenly on both heels so that you are rooted to the ground. Imagine that the earth contains all of the information you need and that the only way it can get to your students is by having the information go out the top of your head.

Stand up straight. This ensures that your voice is full of strength and conviction.

Speak when you are ready to speak

The first few minutes of your lecture will grab or lose your students, so make it effective. Visualize how you are going to start your lecture before you launch into talking. Make sure your posture is good, make sure you are looking into the eyes of the audience, take a deep breath, then begin.

In-Class Activity: The Art of Presentation

Before coming to class today, prepare a short two-minute presentation about yourself. Who are you? What are your academic interests? What course will you be teaching? What skills do you have to bring to teaching this course? This presentation will be starting point for short exercises led by your instructor to solidify the information presented above. The exercises will focus on:

Warm-up
Making eye and energy contact with the audience
Posture

Daily Class Feedback
Introduction and The Habits of an Effective Speaker

1. Please respond to the following statements by placing a check in the appropriate box.

	High or excellent	Good or above average	Average or neutral	Below average	Poor or none
Your previous experience in today's topic	☐	☐	☐	☐	☐
Your previous level of interest in today's topic	☐	☐	☐	☐	☐
Your current level of interest after performing the exercise	☐	☐	☐	☐	☐
The degree of challenge of today's activities	☐	☐	☐	☐	☐
The degree to which the in-class activities contributed to your understanding of the course material	☐	☐	☐	☐	☐
The ability of the instructor to explain today's activities	☐	☐	☐	☐	☐
The ability of the instructor to interest you in today's exercise	☐	☐	☐	☐	☐

2. Please rate the overall value of the topic covered today according to its 1) relevance to your current situation, 2) interest to you, and 3) applicability to future situations.

Category	High or excellent	Good or above average	Average or neutral	Below average	Poor or none
Relevance	☐	☐	☐	☐	☐
Interest	☐	☐	☐	☐	☐
Applicability	☐	☐	☐	☐	☐

3. In one or two sentences, describe one main point you learned today in class.

4. In one or two sentences, what is the main unanswered question you leave with after today's class?

Chapter 3
What Makes an Effective Teacher?

As a graduate student, you have already had significant experience in being a student, probably about sixteen years! This really makes you an expert at what students want from their teachers, but you have probably never thought about it. By examining your experiences as a student, both good and bad, we intend to help you be more conscious of your presence in the classroom as a teacher. In the last chapter, we focused on preparing your "teaching energy" *before* class. We will continue today examining your "teaching energy" *during* the class.

In-Class Activity 1: Instructional Art

This activity is intended to simulate a teaching environment in a relatively non-threatening way. Hopefully, it will elucidate some of the fears and expectations that both teachers and students bring to the classroom. It should also demonstrate some skills that good teachers have.

The instructor will divide the class into pairs. One member of the pair will be "the student," the other member of the pair will be "the teacher." Follow the directions of the instructor closely. At the conclusion of the activity, please answer the following questions. Your answers will be discussed during class.

To the "student" in this activity:

1. How did you feel as you commenced this activity?

2. What did the "teacher" do that helped you accomplish the task?

3. What could the "teacher" have done to help you accomplish the task?

To the teacher in this activity:

1. How did you feel as you commenced this activity?

2. What techniques ensured success in accomplishing this task?

In-Class Discussion 1: The Making of a Good Teacher

Spend about five minutes answering the following questions. We will then have a discussion about what makes a good teacher.

1. Think of a person whom you believe was an effective teacher. Write down some of the characteristics of this person.

2. Think of a person whom you believe was not a good teacher. Write down some of the characteristics of this person.

3. What good teaching characteristics do you already possess?

4. What qualities do you think you will need to improve upon?

In-Class Discussion 2: The First Day of Class

If you have never taught before, you may be terrified of your first day of teaching. The anxiety is understandable, and it is actually a good thing. When it comes time to actually teach, that anxiety will manifest itself as energy, and students want someone who is energized about teaching. But you want to make sure it is good energy. So you need to foster an effective learning environment for your students.

Spend five minutes writing down some thoughts about the following questions. We will then have a discussion about what makes an effective learning environment.

1. What can detract from an effective learning environment?

2. How can we ensure that we maintain an effective learning environment?

3. What are some good things to do on the first day of class to make a good impression?

In-Class Activity 2: Effective Teaching Tips

The following is a list of effective teaching tips that you should keep in mind throughout your teaching career. We will use this list in a role-play demonstrating effective teaching methods.

1. Students are welcome to drop by your office.

2. You make special efforts to be available to students of a different culture than your own.

3. You establish rapport with students the first few minutes of every class.

4. You incorporate group work into your class.

5. You relate current events or activities to the subject in class.

6. You provide written comments of strengths and weaknesses on exams and papers.

7. You provide frequent and varied opportunities for assessment of student progress.

8. You return graded assignments within one week.

9. You grade fairly and consistently.

10. You help students establish challenging goals for learning.

11. You communicate the amount of time you expect students to spend studying for your class.

12. You explain your expectations both orally and in writing at the beginning of the course.

13. You emphasize the importance of high standards of academic achievement.

14. You discuss the progress of the class during the course of the semester.

15. You discourage sarcasm, snide remarks, and kidding.

16. You encourage students to speak up when they do not understand.

17. You select readings and activities related to the students' backgrounds.

18. You distribute performance criteria so that a student's grade is independent of the grades achieved by others.

19. You encourage students to prepare together and to evaluate each other's work.

20. You encourage students to challenge ideas presented in class.

Daily Class Feedback
What Makes an Effective Teacher?

1. Please respond to the following statements by placing a check in the appropriate box.

	High or excellent	Good or above average	Average or neutral	Below average	Poor or none
Your previous experience in today's topic	☐	☐	☐	☐	☐
Your previous level of interest in today's topic	☐	☐	☐	☐	☐
Your current level of interest after performing the exercise	☐	☐	☐	☐	☐
The degree of challenge of today's activities	☐	☐	☐	☐	☐
The degree to which the in-class activities contributed to your understanding of the course material	☐	☐	☐	☐	☐
The ability of the instructor to explain today's activities	☐	☐	☐	☐	☐
The ability of the instructor to interest you in today's exercise	☐	☐	☐	☐	☐

2. Please rate the overall value of the topic covered today according to its 1) relevance to your current situation, 2) interest to you, and 3) applicability to future situations.

Category	High or excellent	Good or above average	Average or neutral	Below average	Poor or none
Relevance	☐	☐	☐	☐	☐
Interest	☐	☐	☐	☐	☐
Applicability	☐	☐	☐	☐	☐

3. In one or two sentences, describe one main point you learned today in class.

4. In one or two sentences, what is the main unanswered question you leave with after today's class?

Thought Paper #1

Due the week of Sept 1, Part 2

Write for one page (either on this page or typed) about a person or event that was important to your intellectual development as a scientist. This person does not have to be someone you liked, but someone who really helped you learn. This paper should go into more detail than our discussion today. Please address the following questions in your paper, as well as any other issues that you believe are relevant to the topic.

- If writing about a person, what personal traits made this person an effective teacher?
- What strategies did the teacher use in the classroom to help you learn effectively?
- What qualities made that person or event of high instructional or motivational value?
- How can you apply these qualities to your teaching?

Chapter 4
The Mechanics of Running a Class

There is a legend among experienced teachers that only one third of your students is actually listening at any given moment. According to probability, if you say something three times, your likelihood of reaching all of your students is nearly 100%. This wisdom is believed to hold true regardless of class format. We use different class formats in teaching (lecture, laboratory, discussion) to convey different types of information. Yet the goal of these formats is the same: to help students learn.

In order to enhance your probability of reaching all of your students, the structure of a class meeting should be the same regardless of whether you are teaching a lecture, a laboratory, or a discussion section. Your class time should be divided into three parts. Every class should begin with a *summary* and end with a *review*. The summary and review should surround the new information that you will teach. From this, the students will have a mental map of the day's activities and will get a feel for what you believe are the major concepts. They may also catch information that they did not catch the first time.

Part I: Summarize new information

You should spend the first ten to fifteen minutes of a laboratory (five to ten minutes for a lecture or discussion) with an overview of the new information, described in the next three bullets.

- Go over the goals of the day's activities. What concepts will be learned today?
- Tie the previous week's material to what will be learned today. You should also relate the laboratory or discussion material to what has been talked about in lecture.
- Give some importance and relevance to the material they will learn about today. How can it by applied to other problems?

Part II: Impart new information

Usually, this is the longest component of a class period.

- For laboratories and discussion: Check on every student's (or group's) progress throughout the laboratory period.
- In a discussion section, have smaller groups work together before convening the larger group. Again, check on every group's progress.
- For a lecture, display an outline showing the progress of the lecture

Part III: Review the new information

- Review the main concepts covered (ten to fifteen minutes for a laboratory, five to ten minutes for a discussion or lecture)
- Relate what the students should have learned to what they already knew before the day's class.
- Demonstrate how this information is important and useful. What problems can be investigated?

Pre-Class Activity: Outlining a Day in Your Class

Before coming to class today, think of a topic that you have to teach soon in your own class. Outline how you will give your talk using the structure proposed above. We will share our outlines in class and find common motifs.

While the structure of the class should not deviate from this three-part motif, this is not to imply that every class should sound like a lecture. You can enhance each part of the class through various proven non-lecture methods that either introduce new information or solidify information already learned. Some non-lecture based teaching methods include:

Group learning
Games
Role-playing
Problem sets and problem-based learning

Using these methods at any point during a lecture, laboratory or discussion not only livens up the class, but it imparts your personality to the class. These methods give you some freedom in the otherwise rigid setting of a class with a lot of sections. As long as the students perform the required tasks, why not help them learn the information in different ways through games or problem-based learning? Your students will certainly appreciate the non-cookie-cutter approach you take to their learning.

Chapters 5 and 7 will introduce you to some non-lecture teaching techniques in broader categories called active learning and classroom assessment. Active learning focuses on non-lecture based methods of teaching, including games, role-playing and group problem-solving. Active learning may be used at any point during a class period, but is usually reserved for Parts II or III where new, difficult information must be acquired. Classroom assessment is a tool for teachers to assess how much information has been learned. It is usually used at the end of class (Part III) to review information learned. Classroom assessment can also be student-centered evaluation of learning because it can show students different ways of organizing information.

Chapter 5
Active Learning through Case Studies

Active learning is a supplemental method to lecturing that engages the students in the material presented. Teaching methods that use discussion-based activities facilitate learning that requires students' active participation. Role-playing, games, or case studies are examples of exercises that achieve this active participation. Active learning can introduce information or review information as an in-class activity.

There are many benefits to using active learning techniques in the classroom for both the teacher and the student. It requires no work for the teacher other than the preparatory work of designing the exercise since there are no assignments turned in at the end of the activity. As stated in the previous chapter, active learning techniques can be used in a variety of settings: lectures, laboratories, or discussions. Students evaluate their own and others' opinions, they verbalize material (a proven method to learn material), they get prompt feedback, and they think more deeply by making associations between material already learned and new material.

Below are some examples of active learning categorized into three different learning levels.

Factual questions/trivia games
- Can get students thinking about the relevant material in a relatively easy format
- But there is high risk for students to answer the questions (right or wrong answers)
- Can be boring for students at a higher learning level

Application/interpretation questions/case studies
- Good way to help students see the importance of the information
- High interest level for students
- But need to make sure all students are at that level

Problem solving/role-playing
- Also good way for students to see relevance
- Holds high interest for students
- Again, need to make sure all students are at that level

Active learning can be highly successful, especially when both the environment and the activity are student-focused. Use the following tips in your active learning activity. You may also find these tips useful if your conducting a discussion section.

- Give students time to write answers before opening up for discussion
- Get students into smaller groups to discuss answers before having a class discussion
- Remove the element of risk for students by not asking factual or rhetorical questions
- Demonstrate progress to the students:
  - Verbalize the goals at the beginning of the section
  - Summarize the main points often by writing them on the board
  - Have a minutes-taker who verbalizes the points made at the end of class or the beginning of the next class

In-Class Activity 1: Case Studies of Common Problems Encountered by TFs

We will use case studies in this class to review information already presented in this course, to introduce topics yet to come, and to demonstrate how case studies might be used as an active learning tool in a classroom. Your instructor will describe this case study activity. Suggested answers may be found at the end of this chapter.

Issue 1

A student comes up after class to tell you that you grade the hardest of any TF she has had. However, you know that your class averages are in line with the other TFs in your course. What do you tell the student?

Issue 2

Twenty minutes into your lab lecture, you notice that students throughout the room are whispering to each other and generally not paying attention. What do you do?

Issue 3

During the semester, you notice that a trio of students consistently talks during class, are not efficient group members, and are often disruptive to the rest of the class. What should you do?

Issue 4

During a lab quiz, you think you see a student's eyes looking at another student's quiz. You are not positive that he/she is cheating, so you don't want to unjustly accuse the student of cheating. What should you do?

Issue 5

While grading lab reports, you come across one that seems very familiar, like one you graded three hours ago. When you go back to the previous paper, your hunch is correct; the papers are nearly identical. What should you do?

Issue 6

When you come in to teach your first lab of the week, your room has been left in shambles by the previous TF and your room is not appropriately supplied for your lab. What should you do?

Issue 7
As a TF, you are expected to contribute 20 hours per week to teaching on average, including grading. However, it seems like every week, you are spending most of your time teaching and not enough time on your own classes. What should you do?

Issue 8
After the first few weeks of class, you decide to look at your class averages so far. Your calculations indicate that both of your sections have an 87% average. Should you be concerned? If so, what should you do?

Issue 9
After turning back lab report #2, a concerned student comes up to you after class to ask you the class average on the report. How can you deal effectively with this student's anxieties about their grade?

Issue 10
A student manages to cut his hand on a glass pipette in the lab. How will you manage the situation?

Issue 11
Every week, a student of yours tells you that the labs are boring and that he has already done them in previous classes. You are concerned that his attitude will have a negative effect on other students' impressions of the course. What should you do?

Issue 12
You have become terribly ill from the various flu infections transmitted by your students. You don't think you can teach your lab in the morning. What should you do?

Issue 13
You have received an award from your department for your excellent teaching abilities. You have enjoyed teaching very much. What can you do with these talents?

In-Class Activity 2: Incorporating Active Learning into your Classes

In this activity, you need to decide how you will incorporate active learning into your class, given the problem presented to you. With one or two partners, design an activity that should liven up your class. You will present both the problem and your solution to the class with your partner(s). Your instructor will tell you which problem to work on with a partner.

Problem 1: You are teaching the 8 AM Friday morning class in introductory biology, and your students always seem tired when they arrive. They also have a hard time getting motivated to do things that early in the morning. You think that something fun, yet on topic, would get them interested. How can you jump-start them into the activities for the day?

Problem 2: You are lecturing on a very difficult concept for freshman biology students - replication of DNA. A lot of the students seem overwhelmed and confused, though not all of them. You want to avoid having the entire class come to office hours. How can you help the students right now in this class period while facilitating active learning?

Problem 3: Your lecture on the comparison of the four major macromolecules appears to be overwhelming the students. You think it would help if they had a table of comparative information between the macromolecules that would summarize all of that information in one place. How can you fill out this summary table during the class period to involve the students in the activity?

Problem 4: You need to prepare a quiz for your lab, but with your own class responsibilities, you don't have a lot of time. In general, your students don't seem to understand mapping restriction sites on a plasmid, so you would like to incorporate a question about it on the quiz. During the lab previous to the quiz, the students have an incubation time for which they have nothing else to do. How can you help them understand the problem while getting your quiz written at the same time?

Problem 5: As the work piles up, your students become lazy in their preparedness for your discussion class. You feel certain that most of them have not read ahead of time. What can you do in future classes to encourage or motivate students to prepare for class without appearing like an ogre?

Problem 6: You are teaching a physiology lab where students review case studies and perform urinalysis tests to determine what is wrong with a case patient. Because most of the students in your class are pre-med students, you want to demonstrate to them the relevance of this activity to their future careers. How can you do this?

Problem 7: In your discussion section, you have a couple of students who rarely talk. You think that they are prepared and intelligent, but that they are probably very shy or timid. How can you find out your entire class's opinions about the discussion in a non-threatening way?

The following are suggested solutions/responses to the problems presented in Activity 1 earlier in this chapter. There may be alternative responses.

Issue 1
A student comes up after class to tell you that you grade the hardest of any TF she has had. However, you know that your class averages are in line with the other TFs in your course. What do you tell the student?

Answer: Tell the student that all TFs are held to a grading standard so that all sections are graded consistently. Your class is no more difficult or easy than any other section. Maintaining the grading standards is much easier than dealing with displeased students.

Issue 2
Twenty minutes into your lab lecture, you notice that students throughout the room are whispering to each other and generally not paying attention. What do you do?

Answer: Your lab lecture is too long and boring. Stop right now, and get the students doing something active. Go around to students whose opinion you trust and ask them what you can do to improve the intensity of your lectures. Alternatively, ask a fellow TF or your lab coordinator to evaluate your performance in the lab.

Issue 3
During the semester, you notice that a trio of students consistently talks during class, are not efficient group members, and are often disruptive to the rest of the class. What should you do?

Answer: Talk to the students after or outside of class and tell them that their lab demeanor is disruptive, and specifically how it is disruptive. If that doesn't help, assign random seating every week and ask that students work only with the people next to them. Tell the students you are trying to facilitate a community spirit in the room by allowing them to meet other class members.

Issue 4
During a lab quiz, you think you see a student's eyes looking at another student's quiz. You are not positive that he/she is cheating, so you don't want to unjustly accuse the student of cheating. What should you do?

Answer: Whisper to the student and tell him/her to keep their eyes on their own paper. Ask the student whose work is being copied to cover his/her paper. Make a public announcement to the class to keep their papers covered. Check the two papers after class. If the answers are too similar, discuss the matter with your lab coordinator.

Issue 5
While grading lab reports, you come across one that seems very familiar, like one you graded three hours ago. When you go back to the previous paper, your hunch is correct; the papers are nearly identical. What should you do?

Answer: Grade both papers as fairly as you can. Inform your lab coordinator of the situation. Make photocopies of both papers and return the graded photocopies to the students. Tell the students what you see. Plagiarism should not be tolerated and should be dealt with according to your department's policies and culture.

Issue 6
When you come in to teach your first lab of the week, your room has been left in shambles by the previous TF and your room is not appropriately supplied for your lab. What should you do?

Answer: First, find the curatorial staff, or have your UA discuss it with them. If the curator is not immediately available, find the lab coordinator, who will ensure that you have the necessary supplies and that your room is neat.

Issue 7
As a TF, you are expected to contribute 20 hours per week to teaching on average, including grading. However, it seems like every week, you are spending most of your time teaching and not enough time on your own classes. What should you do?

Answer: At the next prep session, discuss the issue with the other TFs and the lab coordinator. If everyone is experiencing this problem, then the class work load should be assessed. If this appears to be a personal issue, you and your lab coordinator should work together on talking about grading.

Issue 8
After the first few weeks of class, you decide to look at your class averages so far. Your calculations indicate that both of your sections have an 87% average. Should you be concerned?

Answer: You should definitely be concerned. This problem should be remedied very quickly. Talk with other TFs about how they grade assignments, and talk with your lab coordinator about grading.

Issue 9
After turning back lab report #2, a concerned student comes up to you after class to ask you the class average on the report. How can you deal effectively with this student's anxieties about their grade?

Answer: It is advised not to give out the averages for each assignment. The purpose of grades is not to assess your ranking compared to other students, but to assess individual progress. Tell the student that the class average is maintained consistently between sections. If they have specific questions about the assignment, you would be happy to discuss them with the student.

Issue 10
A student manages to cut his hand on a glass pipette in the lab. How will you manage the situation?

Answer: Remain calm! Either you or your UA should call the campus police immediately. Do not touch other's blood with bare hands. Find a quiet place for the student to wait for help, and have someone else stay with them, preferably your UA, the lab coordinator, or someone from the curatorial staff.

Issue 11
Every week, a student of yours tells you that the labs are boring and that he has already done them in previous classes. You are concerned that his attitude will have a negative effect on other students' impressions of the course. What should you do?

Answer: Recommend to the student that he/she take an upper-level course if possible. If this is not possible, tell the student that his/her previous experience would be a great help to the other students in the class. Tell him/her that this class should be easy and he/she can help other students with the material. Perhaps that student could take on a peer-tutorial role.

Issue 12
You have become terribly ill from the various flu infections transmitted by your students. You don't think you can teach your lab in the morning. What should you do?

Answer
Call your lab coordinator at home (or in the office during working hours) as soon as possible so that a substitute TF can be arranged. You or your lab coordinator should work out how to compensate the substitute for his/her time.

Issue 13
You have received an award from your department for your excellent teaching abilities. You have enjoyed teaching very much. What can you do with these talents?

Answer
Stay involved! We need excellent teachers to be mentors to incoming teaching fellows. Your experience and know-how are very valuable attributes. Participate whenever possible in the TF training program, in evaluating TFs informally, or as a seasoned TF in a course.

Daily Class Feedback
Active Learning Through Case Studies

1. Please respond to the following statements by placing a check in the appropriate box.

	High or excellent	Good or above average	Average or neutral	Below average	Poor or none
Your previous experience in today's topic	☐	☐	☐	☐	☐
Your previous level of interest in today's topic	☐	☐	☐	☐	☐
Your current level of interest after performing the exercise	☐	☐	☐	☐	☐
The degree of challenge of today's activities	☐	☐	☐	☐	☐
The degree to which the in-class activities contributed to your understanding of the course material	☐	☐	☐	☐	☐
The ability of the instructor to explain today's activities	☐	☐	☐	☐	☐
The ability of the instructor to interest you in today's exercise	☐	☐	☐	☐	☐

2. Please rate the overall value of the topic covered today according to its 1) relevance to your current situation, 2) interest to you, and 3) applicability to future situations.

Category	High or excellent	Good or above average	Average or neutral	Below average	Poor or none
Relevance	☐	☐	☐	☐	☐
Interest	☐	☐	☐	☐	☐
Applicability	☐	☐	☐	☐	☐

3. In one or two sentences, describe one main point you learned today in class.

4. In one or two sentences, what is the main unanswered question you leave with after today's class?

Thought Paper #2

Due the week of Sept 15

Write one page (either on this page or typed) about your experiences on your first day of teaching. Please address the following questions in your thought paper as well as any other issues you think are relevant to this topic.

- What was the overall students' responses to you (either implied or verbalized)?
- What went well?
- What needed work?
- How did you address/fix the problem areas?
- How will you address/fix these problems in the future?
- Did anything surprise you about your first teaching experience?
- Did any advice or instruction given to you so far in this class help you in the classroom? Please explain.

Chapter 6
The Diversity of Learners

The process of learning can be thought of as a four-dimensional activity affected by: 1) the materials used to learn, 2) the criterial tasks used to evaluate learning, 3) the learner's characteristics such as motivation and attitude toward learning, and 4) the learner's strategies for learning (Bransford JD (1979) *Human cognition: Learning, Understanding, and Remembering*. Belmont, CA: Wadsworth). So far in this course, we have addressed aspects 1 and 2, the mechanical aspects of teaching: how to speak effectively, how to liven up lectures with activities, and how to grade efficiently and fairly. To some degree, the previous chapters have been teacher-centered: what can you do in class to be a better teacher? The aspect that we have not really covered yet is the student. Our discussion today will center upon how students learn from two aspects: learning styles and learning activities. The discussion of learning styles is based upon Silver RJ and Hanson HF (1998) *Learning Styles and Strategies*. Woodbridge, NJ: Silver Strong and Associates.

A Little Psychology

The willingness and ability to learn is determined by behavior. Carl Jung believed that behavior was determined by three qualities: Attitude, Perceiving, and Judging. The Attitude dimension to behavior describes the individual's need for interactions. People are either extraverted or introverted. We will be dealing only with the other two dimensions of human behavior: Perceiving and Judging. In other words, for our purposes, how you acquire information about a situation is determined by how you view the event and then how you make decisions about that event.

Perceiving

People perceive the world differently, and Carl Jung believed that people perceived the world in one of two ways, through Sensing (S) or Intuition (N). *Sensing people* use their five senses to gather information about the world. They gather facts. *Intuition people*, on the other hand, make relationships and interpretations about events. They do not necessarily have to sense it personally in order to perceive it. Intuition people usually deal very well with abstractions and representations, unlike sensing people.

Judging

Jung divided the judging aspect of people into two categories of people, the Feeling (F) and the Thinking (T). *Feeling people* make decisions based in the personal import of a situation. What will it do for them? How will this impact them personally? *Thinking people*, on the other hand, judge things based on cause and effect. If I do this, what will happen?

The combination of the perceiving dimension and the judging dimension creates a two-dimensional representation of how a person will respond to certain situations and in what manner they acquire information. That two-dimensional view is shown below.

	Perceiving (S/N)	
Judging (F/T)	SF	NF
	ST	NT

Most people do not fall squarely into one of these categories and can learn information in many different ways. In other words, their learning behavior may be determined by the learning situation. Furthermore, highly educated people have usually been exposed to all of these forms of learning, so they may be rather comfortable with most learning styles. However, everyone has a preferred learning style, which is dominant, and then subordinate traits that pop up occasionally. This preferred learning style affects how we learn and what kinds of assignments we prefer to do. Summarized below are the kinds of assignments and activities that different learners typically prefer.

SF: Journals, peer tutoring, observational note-taking, oral reports
ST: mastery learning games, memorization, checklists, demonstrations
NF: moral dilemmas, creative problem solving, artistic expression, observational note-taking
NT: open-ended questions, essays, Socratic teaching, planning

Pre-Class Activity: Understanding your learning style

Before coming to class today, answer the following questions. Then take a learning styles inventory provided by your instructor.

1. Based on the reading above, what do you think is your preferred learning style?

2. Based upon the reading above, what kinds of assignments do you find interesting?

3. Based upon the reading above, what kinds of assignments help you learn material the best?

4. After taking your learning styles inventory, what kind of learner are you? What is your preferred learning method?

5. What kinds of assignments are best suited to your learning?

In-Class Activity: Designing Activities Appropriate for Different Learning Styles

Read the learning goals for a typical introductory biology class described below and choose one for this exercise. Then, with one or two partners, design an activity that meets the needs of one type of learner. Your instructor will assign you to a learning style.

Case 1: Cellular and Molecular Biology

Students are expected to know what happens in each of the four major phases of development in a frog. They should know the order of the stages. They should also be able to identify stages from a description or a picture. Design a lecture and laboratory curriculum that addresses these goals with respect to a specific learning style.

Case 2: Plant Physiology

Students are expected to know the major structures of a plant. Furthermore, they should be able to identify structures that allowed for the evolutionary movement of plants from aquatic life to terrestrial life. Design a lecture and laboratory curriculum that addresses these goals with respect to a specific learning style.

Case 3: Immunology

Students should know the major cell types involved in immunity. Furthermore, they should know the role that each type of cell plays in immunity. Design a lecture and laboratory curriculum that addresses these goals with respect to a specific learning style.

Learning Activities

In addition to thinking about how students best learn the information presented, you also need to consider what skills you want students to acquire. There are many different levels of learning, from the very basic, superficial facts, to integration and application. When choosing the activities in a class, consider how deeply you want students to understand the material at the end of the course. You should create an expectation of learning throughout the semester in all course activities, not just on the final exam. Listed below are three thinking levels and their associated activities.

Level I = Knowledge and comprehension

Describe
Name
List
Outline
Brainstorm
Sort
Remember
Take notes

Level II = Apply/Analyze

Organize
Plan
Graph
Categorize
Suggest
Interpret
Explain
Summarize
Generalize
Illustrate

Level III = Synthesize/Evaluate

Develop
Devise
Construct
Counsel
Compose
Critique
Judge
Debate
Invent
Design

In-Class Activity: Designing Activities Appropriate for Different Learning Activities

Using the same case study and learning goals you used from the previous activity, design an activity that addresses a learning goal at a level that will be assigned to you by the instructor. Perform this activity with one or two partners. Be prepared to give a short presentation on the activity you have designed.

Daily Class Feedback
How do People Learn?

1. Please respond to the following statements by placing a check in the appropriate box.

	High or excellent	Good or above average	Average or neutral	Below average	Poor or none
Your previous experience in today's topic	☐	☐	☐	☐	☐
Your previous level of interest in today's topic	☐	☐	☐	☐	☐
Your current level of interest after performing the exercise	☐	☐	☐	☐	☐
The degree of challenge of today's activities	☐	☐	☐	☐	☐
The degree to which the in-class activities contributed to your understanding of the course material	☐	☐	☐	☐	☐
The ability of the instructor to explain today's activities	☐	☐	☐	☐	☐
The ability of the instructor to interest you in today's exercise	☐	☐	☐	☐	☐

2. Please rate the overall value of the topic covered today according to its 1) relevance to your current situation, 2) interest to you, and 3) applicability to future situations.

Category	High or excellent	Good or above average	Average or neutral	Below average	Poor or none
Relevance	☐	☐	☐	☐	☐
Interest	☐	☐	☐	☐	☐
Applicability	☐	☐	☐	☐	☐

3. In one or two sentences, describe one main point you learned today in class.

4. In one or two sentences, what is the main unanswered question you leave with after today's class?

Thought Paper #3

Due the week of Sept 29

Write a one page evaluation to be used by your students to evaluate your performance as a teacher so far. Consider the following items for evaluating and any other items you would like to include. This evaluation should be distributed to your class sometime between Sept 29 and Oct 27 (see Thought Paper #4, page 61). You may use the BI 699 copy code to copy your evaluation.

Clarity
Tone
Level of knowledge expected
Organization
Fairness
Attention to detail
Attentiveness to students needs
Ability to answer questions

Chapter 7
An Introduction to Classroom Assessment

Classroom Assessment is similar to Active Learning, particularly to the student. They are both activities performed in class that are meant to help further knowledge integration. However, classroom assessment usually involves work that is turned into the teacher at the end of the class. This work may or may not be graded, but its intent is to help the teacher obtain information on how much information students are acquiring. The ultimate goal of classroom assessment is to provide feedback to the teacher to improve teaching.

At this point, it may seem that classroom assessment is really only applicable to teachers who are lecturing in their own courses. While it is particularly valuable to those people, TFs of labs and discussion sections may also use it. Classroom Assessment can be student-focused in that it can demonstrate to students different methods of thinking about and/or organizing information. One particularly good book about classroom assessment for a variety of different classes is T.A. Angelo and K.P. Cross (1993) *Classroom Assessment Techniques: A Handbook for College Teachers*. Jossey-Bass Publishers: San Francisco. However, several techniques relevant to the sciences have been outlined below.

Focused Listing

Instructor selects a topic or concept. Students have a limited time to write as many related words, phrases or topics as they can. Students share their lists with the class (students can call out terms that are then written on the board). A variation on this technique would be to diagram the topic, choosing linking words between bubbled topics. This activity can be done either at the beginning or the end of a lecture. Good for a survey or introductory course with lots of new terms to learn.

Categorizing Grid

Instructor draws a table with row and column headings representing important categorizing traits for important lecture information. Students fill in the information using only words or short phrases. Students could work in groups, which then share the information to the class. Best done at the end of a lecture containing lots of comparative information.

Or Defining Features Matrix

Instructor provides traits which must be compared between two or more things (concepts, organisms). Students fill in a grid, indicating with +/- symbols whether these traits are present or absent. Pick particularly confusing concepts (ones that appear to be similar at first glance).

Minute Paper

Instructor chooses a question (often “what was the most important thing you learned today” or “what important question remains unanswered”) to which the students have one minute to respond. This activity may be done at the beginning or the end of a lecture, depending on the goal. Instructor should choose one or two questions to answer in the next class period.

Content, Form, and Function Outlines

Instructor chooses a short relevant text. After reading the text, students should be able to answer what, how and why questions in an outline format. For biology classes, newspaper articles or news video may be appropriate. Good for showing the application of their knowledge to everyday events.

One Sentence Summary

Instructor chooses a topic which the students must summarize in one sentence ("who does what to whom, when, where, how and why?"). Students have a defined period of time to summarize. Must be a topic that you can summarize and that does not have too many answers or parts.

Student-Generated Test Questions

Instructor chooses topics that will be covered on the test and determines the kinds of questions that will be asked. The instructor then allows the students to generate a limited number of questions following the format determined by the instructor. Allow all students to see all questions before the test.

Human Tableau or Class Modeling

Instructor selects a process or structure important to the class topic. What can students learn from this that they cannot learn any other way? Can the students recreate this thing with their bodies without props? Give students certain parts of the structure to participate in. Be sure to identify the important learning goals as the students create this structure or process.

In-Class Activity 1: Using Classroom Assessment as an Active Learning Tool

Your instructor will assign you with a specific classroom assessment technique. With one or two partners, decide upon a biological topic that is particularly difficult for students to understand. Then, design an activity that will both help your students learn a concept and help you assess whether they understand the material. You and your partners will present your problem and solution to the class.

Daily Class Feedback
Introduction to Classroom Assessment

1. Please respond to the following statements by placing a check in the appropriate box.

	High or excellent	Good or above average	Average or neutral	Below average	Poor or none
Your previous experience in today's topic	☐	☐	☐	☐	☐
Your previous level of interest in today's topic	☐	☐	☐	☐	☐
Your current level of interest after performing the exercise	☐	☐	☐	☐	☐
The degree of challenge of today's activities	☐	☐	☐	☐	☐
The degree to which the in-class activities contributed to your understanding of the course material	☐	☐	☐	☐	☐
The ability of the instructor to explain today's activities	☐	☐	☐	☐	☐
The ability of the instructor to interest you in today's exercise	☐	☐	☐	☐	☐

2. Please rate the overall value of the topic covered today according to its 1) relevance to your current situation, 2) interest to you, and 3) applicability to future situations.

Category	High or excellent	Good or above average	Average or neutral	Below average	Poor or none
Relevance	☐	☐	☐	☐	☐
Interest	☐	☐	☐	☐	☐
Applicability	☐	☐	☐	☐	☐

3. In one or two sentences, describe one main point you learned today in class.

4. In one or two sentences, what is the main unanswered question you leave with after today's class?

Part II:

Surviving Teaching and

Graduate School

Chapter 8
Grading

Giving grades is the activity which graduate students like the least but that students most desire. It is a time-consuming but necessary process used to give each student feedback on how much they have learned relative to the teacher's expectations. The most important issue regarding grading is fairness. To be fair, students should know exactly what they will be graded on (i.e. what is the instructor looking for?). Furthermore, all students should be graded using the same criteria. This can be particularly difficult in a course with many sections and/or many instructors. Therefore, as a teaching fellow, you should work closely with your teaching coordinator and the other teaching fellows to clearly outline the grading criteria.

In addition to maintaining fairness between sections, the establishment of grading criteria can save you time. You may spend less time addressing student grade issues if the criteria are clearly defined and fairly executed. Furthermore, you do not need to spend extra time deciding how to grade *each* assignment since all assignments will be judged according to the same criteria. The following discussion of grading criteria is based upon Walvoord BE and Anderson VJ (1998) *Effective Grading*. Josey-Bass: San Francisco.

Primary Trait Analysis is an effective method of generating grading criteria. A list of required traits is generated with each trait given a point value. If the trait is missing or poorly done, points are not given. This list is distributed to the students ahead of the due date for the assignment. An alternative is to define grades based upon traits. In other words, an A or full credit assignment has certain characteristics, a B assignment would be missing one key characteristic, etc. A sample PTA is given below.

BI 108 Spring 2002, Katie Kearns
Lab Report Grade Sheet

Section	**Value**	**Characteristics**
Title	3	Accurately describes experiment with appropriate tone for a science journal
	2	Mentions either subject of study or experimentation techniques, but not both
	1	Not descriptive enough to know what was studied or how it was studied
Abstract	3	Gives adequate background to understand objectives; briefly describes methods and overall results; gives conclusion and/or importance to results and experiment
	2	As in (3), but error in one of the key traits
	1	As in (3), but error in several of the key traits
Introduction	5	Presents relevant background to experiment; relates background to objectives; states both objectives and hypotheses; all relevant background cited
	4	Presents relevant background to experiment; missing one of the other traits
	3	Presents irrelevant background or relevance unclear; or missing more than one other trait
	2	Presents irrelevant background or relevance unclear and several other key traits missing
	1	Background material copied from or substantially similar to lab manual
Overall content	3	Conveys commanding knowledge of topic; demonstrates independence of thought; material presented in logical order; proper spelling and grammar
	2	Conveys adequate knowledge of topic with no spelling/grammar/typographical errors
	1	Demonstrates poor knowledge of topic; improper spelling or grammar, poor proofreading

There are many benefits of using a PTA for establishing grading criteria. From the teacher's perspective, it is relatively easy to score assignments since the score is determined by the number of traits. Students also benefit because the scale for scoring and the traits to be scored are identified so students know how to expend their effort. Finally, since students can see what level of work constitutes a certain grade level, the use of a PTA emphasizes concepts or ideas about writing instead of just the grade.

Pre-Class Activity: Designing a PTA

Before coming to class today, bring in an assignment that you must grade for your teaching duties. The relative importance of the assignment (i.e. total point value) does not matter. You will work with a partner during class to design a PTA for grading that assignment. If it is a large assignment, work on a small section of it. Be prepared to present the PTA you have designed to the class. In designing your PTA, consider the following questions:

1. What is the objective of this assignment? What skills should the students work on or acquire by doing this assignment?

2. What components are you looking for in the answers to this assignment?

3. What is the relative weight of these components? Are they equally important?

Grading using a PTA

There is a temptation when grading to justify a grade given by writing lots of comments on a paper. The PTA should help you minimize that because a trait is either there or it is not, requiring little explanation. Additionally, writing lots of comments in the margins of papers is a waste of time for two reasons.

Use teachable moments to help students correct errors

The moment when students get their papers back and flip through your comments is not a teachable moment. Students generally do not associate what you have written with what they wrote. Despite all of your comments in the margins, they tend to make the same mistakes in the next assignment.

Some students need a grade, but most really need your suggestions because the point of a grade is to improve student learning. Spend your time on commenting about their work, both good and bad, not just giving the grade. However, avoid writing lots of comments in the margins. To make a teachable moment out of handing back papers, write each student a letter about their paper or hold a conference with each student. Discuss what was good about their paper, and what needs improvement. The students need your suggestions, not out-of-context comments in the margins.

Save time by creating a common error key

You may find that many students make the same errors. Instead of writing the same comment on every single paper, make yourself a numbered key, with each kind of error receiving a number. Then just write the appropriate number where the error was made. Give each student a copy of your error key when you hand back the assignment.

As a teaching fellow, you may or may not have much control over the grading systems used in the course you teach. However, if the grading system does not seem like an instructive and constructive use of your time, it's worth discussing with the teaching coordinator. Just be sure that if you are teaching a multi-section course, the same system is used in all sections. Below are some other suggestions for minimizing the time and energy you spend grading. Discuss the implementation of these with your teaching coordinator before implementing any of these. Remember, fairness between teaching fellows in grading is essential.

Use only as many grade levels as you need.

In a 100 point class, is 0.05 points going to change a student's letter grade? How about a 500 point class?

Be aware of how much time you spend grading.

You should be spending on average 20 hours per week on all teaching-related activities. If you are consistently over that, the assignment load and the grading procedures need to be evaluated. Talk with your teaching supervisor as soon as your grading load appears out of hand.

Consider whether all assignments need to be graded

Some assignments are not worth much in the course, but still have instructive value. Can students evaluate each other's work instead of having a documented grade from the instructor? Can some assignments have a +/- grade system instead of a numerical value? Can some assignments just receive comments without a grade?

Course Grades

As a teaching fellow, you probably have little input into how students' final grades are determined. However, the following discussion is provided for you in case you ever teach your own course. Regardless of how much effort you put into stressing concepts, ideas, and knowledge, students ultimately want to know their letter grade and where they stand in the course. There are several methods of determining the course grade, and the choice of method largely depends upon the instructor's teaching goals.

Weighted Letter Grades

This is the most common method of determining course grades so students are most familiar with this. Different types of evaluation are weighted differently in the final grade calculation. This means that poor testing through one type of evaluation can be harmful to a student's grade. Furthermore, excellent performance in a category may or may not affect a student's grade, depending upon whether that category is heavily weighted in the final grade. Variations include weighting earlier tests less than later tests.

4 multiple choice tests = 10% each
1 term paper = 15%
4 short written homework assignments = 5% each
Final essay exam = 20%
Attendance=5%

A = 88-100%
B = 78-87%
C = 68=77%
D = 58=67%
F = < 58%

Accumulated Points

This is a more descriptive way of determining grades so that the students know their grade goal at the outset of the course. If all assignments are weighted equally, they can compensate for poor performance in one area with points from another category as long as the points available in each category are equal. Poor performance early on is not fatal and students can decide when to put in effort in the course. As an optional curve, the instructor can offer more than the maximum points.

2 multiple choice tests = 50 points each
2 essay tests = 50 points each
1 term paper = 100 points
2 homework assignments = 50 points each
1 final exam = 100 points

A = 425-500 pts.
B = 350-424 pts.
C = 275-349 pts.
D = 200-274 pts.
F = less than 200 pts

Definitional System

In this system, students must be adept at all evaluation methods and cannot substitute for poor work. This method demonstrates that good students are prepared all the time. Furthermore, this method relieves the teacher of some grading as they may use a pass/fail or +/- system for grading.

A = pass 90% of all assignments
B = pass 80% of all assignments

The Curve

The curve can be incorporated into any of the other grading systems when it is used to bump up the grades of all students on a particular test. It can also be used to determine the course grade where only certain percentages of the class get a certain grade. It implies to the students that a grade is a limited commodity and students are ranked according to each other.

A = top 10% of the class (top 10 students out of class of 100)
B = next 10% of the class

Issues in Grading

In grading, we first need to understand what the students' needs are for feedback

Learning Goal Orientation Scale

- The opportunity to do challenging work is important to me.
- When I fail to complete a difficult task, I plan to try harder the next time I work on it.
- I prefer to work on tasks that force me to learn new things
- The opportunity to learn new things is important to me.
- I do my best when I'm working on a difficult task.
- I try hard to improve on my past performance.
- The opportunity to extend the range of my abilities is important to me.
- When I have difficulty solving a problem, I enjoy trying different approaches to see which one will work.
- On most jobs, people can pretty much accomplish whatever they set out to accomplish.
- Your performance on most tasks or jobs increases with the amount of effort you put into them.

Performance Goal Orientation Scale

- I prefer to do things that I can do well rather than things that I do poorly.
- I'm happiest at work when I perform tasks on which I know that I won't make any errors.
- The things I enjoy the most are the things I do the best.
- The opinions others have about how well I can do certain things are important to me.
- I feel smart when I do something without making any mistakes.
- I like to be fairly confident that I can successfully perform a task before I attempt it.
- I like to work on tasks that I have done well on in the past.
- I feel smart when I can do something better than most other people.
- Even if I know that I did a good job on something, I'm satisfied only if others recognize my accomplishments.
- It's important to impress others by doing a good job.

Questions:

1. To what degree do you agree with each of these statements about your own learning?

2. To what degree do you think that these orientations are developmental versus environmental versus innate?

3. Given that teaching should emphasize learning goals more than performance goals, how can we foster a learning-oriented environment, especially in our grading?

Questions to consider when developing a grading plan

1. Will I grade on an absolute (criterion-referenced) standard, on a relative (norm-referenced) standard, on subjective determinations of student learning, on student-teacher contracts, or on some other method of grading?

2. What are my reasons for choosing the method I will use?

3. What do I consider outstanding performance?

4. How should an average student perform?

5. What are my reasons for allowing or not allowing students opportunities to earn extra credit?

6. What are my values concerning student attendance, class participation, and completion of assignments?

7. Will I depend upon a single method for assessing students' learning, or will I use a variety of methods (tests, writing assignments, oral presentations)?

8. Have I described my grading plan adequately to students in writing in the course syllabus and orally at the beginning of the course?

9. How will I handle late or missing assignments?

Daily Class Feedback
Grading Fairly, Effectively, and Efficiently

1. Please respond to the following statements by placing a check in the appropriate box.

	High or excellent	Good or above average	Average or neutral	Below average	Poor or none
Your previous experience in today's topic	☐	☐	☐	☐	☐
Your previous level of interest in today's topic	☐	☐	☐	☐	☐
Your current level of interest after performing the exercise	☐	☐	☐	☐	☐
The degree of challenge of today's activities	☐	☐	☐	☐	☐
The degree to which the in-class activities contributed to your understanding of the course material	☐	☐	☐	☐	☐
The ability of the instructor to explain today's activities	☐	☐	☐	☐	☐
The ability of the instructor to interest you in today's exercise	☐	☐	☐	☐	☐

2. Please rate the overall value of the topic covered today according to its 1) relevance to your current situation, 2) interest to you, and 3) applicability to future situations.

Category	High or excellent	Good or above average	Average or neutral	Below average	Poor or none
Relevance	☐	☐	☐	☐	☐
Interest	☐	☐	☐	☐	☐
Applicability	☐	☐	☐	☐	☐

3. In one or two sentences, describe one main point you learned today in class.

4. In one or two sentences, what is the main unanswered question you leave with after today's class?

Chapter 9
Academic Honesty at BU

When a student first registers at Boston University, they receive a copy of the Academic Conduct Code, a description of the expectations of honest behavior and the definitions and penalties for dishonest behavior. While every student should know about the code, there are still cases of academic dishonesty on our campus. Why does it happen?

Perhaps a student is backed into a corner because of procrastination or too much work and feels compelled to use someone else's work as their own. Perhaps the student has a poor understanding of the material and the student decides to cheat on a test. Perhaps the student perceives that their instructor is not vigilant about academic honesty and the student believes he/she can get away with it. Or perhaps the student honestly does not understand what academic honesty is.

Students at Boston University are expected to act with integrity and honesty, so that all students feel that their accomplishments have been fairly judged by their instructors. BU defines academic misconduct as:

> conduct by which a student misrepresents his or her academic accomplishments, or impedes other students' chances of being judged fairly for their academic work. Knowingly allowing others to represent your work as their own is as serious an offense as submitting another's work as your own.
>
> www.bu.edu/CAS/undergraduate/conductcode.html

Examples of academic misconduct defined by BU include cheating on an exam, representing another's work as your own, falsifying data, stealing an exam, talking during an exam, allowing another student to use your work as their own, forging University documents, or submitting the same work in multiple courses without permission.

Cases of academic misconduct are brought to the attention of the dean by the faculty member in charge of the course. The case is then forwarded to the Academic Conduct Committee, a panel of eight faculty members and four junior or senior undergraduates. This panel hears statements made by both the faculty member making the charge and the student in question, taking into account all evidence presented at the hearing. A quorum decision must be reached by the committee for action to be taken upon the student. Penalties for academic misconduct may range from reprimand, probation, suspension for one to three terms, or expulsion.

With such high stakes involved with academic misconduct, we need to be proactive with our students. We should teach our students about what academic honesty means in our courses and we need to be vigilant so that students understand that the instructors take academic honesty seriously. What specific actions can we take?

Have a discussion about academic honesty at the beginning of the semester

Discuss with your students how they can act honestly in your classroom in all of the various activities they need to perform. For the science courses, the rules include:

- Doing all written work independently, including exams, papers, homework, quizzes
- Not allowing other students to view your work
- Giving credit to words and ideas that are not your own through citations/footnotes/quotes

Give students a content-specific example of plagiarism

Show students the correct and incorrect way to use sources to support an argument in a paper.

For large projects, have parts due along the way

Check on the progress of students throughout the semester. Ask for an outline, a bibliography, a paragraph describing how a source contributes to a paper or project. Allow students to correct possible plagiarism before the final project is due.

Have project discussions with each student

Long before a project or paper is due, discuss it with each student individually. This will give you an idea of whether the student is doing the work independently or not.

Proctor classrooms vigilantly

- Make students sit every other seat with students directly behind each other (i.e. no staggering).
- Walk up and down each row throughout the exam.
- Look for notes underneath chairs.
- Keep an eye out for wandering eyes.
- Stand near students whose eyes wander quite a bit. If student A appears to be looking at student B's paper, ask student B to cover their paper. Or ask student A to keep their eyes on their own paper.

Make assignments that are difficult to cheat on

Write new tests each time you teach. Multiple choice tests are easy to cheat on for a number of reasons. If the test is not well-designed, a student can interpret the desired answered just by the phrasing of the choices. A student can also look at another student's answer key and easily see the bubbled answers. Essay tests are harder to cheat on because the answers usually are not easy to see on another student's paper.

Take some of the stress out

Give assignments throughout the semester that are similar in format and content to questions likely to be encountered on tests.

Give students a testbank of your previous exams so that they will have an idea of the format and content of your exams. Consider allowing students to write their own questions that will be included on the test.

Think about the number of assignments given throughout the semester and the amount of time you expect from each assignment. Is the workload appropriate for the amount of learning involved? Is your big assignment due the same day as chemistry's big midterm? Is there any way the assignment could be due another day?

What should a teaching fellow do if cheating is suspected?

If you suspect that a student has cheated or plagiarized, speak to your teaching coordinator as soon as possible to decide upon a course of action. Then have a meeting with the student as soon as possible. Memories fade as time passes, so the sooner you deal with it, the better. Accumulate as much evidence as you can, whether it is witnesses, papers, disks, emails, etc.

Online Resources about Plagiarism

Examples of plagiarism:

http://www.princeton.edu/pr/pub/integrity/pages/plagiarism.html

Two examples of plagiarism from two different fields. In the example from a literary class, the original English text is included with three different examples of plagiarism. The second example is from a computer class showing how a program given in the textbook has been plagiarized. Both examples effectively demonstrate the range of plagiarism offenses.

http://www.indiana.edu/~wts/wts/plagiarism.html

In this website, the author presents an excerpt from an original text. The author then gives one example of plagiarism, with two examples of how to use the excerpt properly using paraphrasing and/or quotations.

Sites about designing "plagiarism-proof" assignments

http://www.lib.umich.edu/acadintegrity/instructors/index.htm

Contains links to sites about why students cheat or plagiarize, how to detect plagiarism, and case studies for instructors to consider.

http://www.virtualsalt.com/antiplag.htm

A guide for instructors on understanding plagiarism and how to prevent it by designing assignments effectively. Also has a list of both "research paper mills" and detection sites.

Interactive tests for identifying plagiarism:

http://www.lib.umich.edu/acadintegrity/

This website has lots of helpful links about plagiarism, some for students and some for instructors. On the instructor side, there are pages about how to recognize the different forms of plagiarism and guides to constructing assignments so that the likelihood of plagiarism is reduced (see above). On the student side, there are tests that help the student identify the different forms of plagiarism.

And a real eye-opener

http://www.coastal.edu/library/mills2.htm

Intended for instructors, this site contains a list of over 250 web sites that supply term/research papers to students at a cost. The purchased papers are always advertised as guides or aides to students for writing their own papers.

Authorship Case Study:
Criteria for Authorship and Attribution
Source: Association of American Medical Colleges (1994).
"Teaching the Responsible Conduct of Research Through a Case Study Approach."
Washington, D.C., AAMC. Case B3, pages 45-46.

Bob Powell, a postdoctoral fellow in biochemistry, has just completed a manuscript detailing the results from the first project in which he had taken a leading role. The focus of his project has been to discern the ways in which humans metabolize sulfites, a class of chemicals commonly used to preserve wines and dried fruits. Although he had developed the rough outlines of the project on his own, he owes much to individuals both inside and outside his lab. The assistance he received from others includes the following:

A colleague at another university, a toxicologist specializing in food additives, shared with Bob his previous work on the in vivo activity of sulfites, information that allowed Bob to choose the ideal animal model for the experiment -- the Abyssinian field mouse.

A friend of his, who happened to be a wildlife specialist, provided Bob with much advice on rearing and maintaining a colony of Abyssinian field mice such that he would have stable pool of animal subjects.

A highly experienced technician in the lab gave Bob advice on modifying an assay he had been using, which finally allowed him to measure successfully sulfite metabolites in mouse urine. This technician also assisted in writing up the methods section of the paper.

The number of assays that Bob had to conduct was quite sizable and more than he could manage on his own, given the other demands of the project. Thus, an undergraduate college student collected most of the urine samples and conducted the assays yielding the data.

Finally, a senior researcher in a neighboring lab who took an interest in Bob's career offered to review the initial drafts of Bob's paper. By the end of the writing process, this researcher had helped Bob outline the paper, suggested a few additional experiments that strengthened the paper's conclusions, and made a number of editing changes in the penultimate draft that enhanced the paper's clarity.

What kind of attribution should be given to each of these individuals who contributed in one way or another to Bob's project? For example, who should be recognized as an author and who should receive an acknowledgement in the paper? Who does not merit formal recognition?

What criteria should be applied when determining whether:
to list someone as an author?
to note someone's contributions in the acknowledgement?

What are the responsibilities of authors in representing the contributions of others?

At what point in the process of conducting and reporting on one's research should decisions concerning authorship and acknowledgements be made?

Are decisions concerning attribution entirely Bob's responsibility? Should he consult with others? Why or why not?

Responsible Data Management

From the RRP presentation by Brenda Gillespie and Edward D. Rothman, November 1998.

Dr. John designed an experiment in his grant to compare two different fiber diets, stating that he would need 200 subjects, in this case goats. The outcome concerns % fat content of milk after three weeks. He would like to see a treatment difference, but would not be upset if there were none. The research was funded, for less than the full amount, and the study proceeded as planned, more or less.

Should we be concerned about Dr. John's biases at this point?

Part way through recruitment, Dr. John realizes that no differences are emerging -- the new diet is no better than the old. Since funding has gotten tighter, with lab expenses higher and the new RA stipend rate increased (without warning), Dr. John decides to stop the experiment after 113 animals.

Is Dr. John justified in stopping early? (Would your answer change if you knew that the new diet has additives that have never been fed to animals?) How could he have designed the study better in this regard?

Now Dr. John wants to "validate" his results. He turns to Belinda, a statistician at the nearby Consulting Facility, to verify his analytical approach. Dr. John offers to put Belinda on the paper if she will provide a nice graphical display to show no differences. Well into the discussion, Dr. John volunteers that he looked at his results and stopped recruitment, as he understood to be standard practice in his field.

What should Belinda do?

The Jessica Banks Case

Source: "Moral Reasoning in Scientific Research: Cases for Teaching and Assessment," Poynter Center for the Study of Ethics in American Institutions, Indiana University

Jessica Banks, a Ph.D. student in Professor Brian Hayward's lab, has recently defended her dissertation and is now ready to file it and leave for her new job. During her second year, when starting research in Hayward's lab, Banks divided her time among three projects. Then in her third year, after consultation with Hayward, she decided to continue and expand upon one of the three lines of investigation for her dissertation research. This was also the project most closely related to Hayward's grant at the time. Later, Banks's experimental plan and early results were included in Hayward's grant renewal. The other two promising lines of research were left incomplete.

Banks's new job is a tenure-track position in a mid-sized western liberal arts college. Shortly before leaving for her job, she comes into the lab to pick up her notebooks. Although her new faculty position will place a heavy emphasis on teaching, she is looking forward to continuing to do some research as well. In particular, she is eager to pick up where she left off with the two uncompleted projects she worked on before.

Professor Hayward meets Banks on her way into the lab, and their genial conversation abruptly changes when she mentions she has come to take her notebooks.

Hayward exclaims, "You can't take those notebooks away -- they belong to the lab!"

Banks is confused. "But I did the work, and I wanted to follow up on it. I can't do that without the notebooks."

Professor Hayward is adamant. "I'm sorry, but you should understand this. This lab is a joint enterprise, and all the work you did was funded by money I brought in via grants. The notebooks don't belong to you, nor to me; they belong to the lab, and the work will be continued in this lab. I've already talked to one of the new students about working on those projects this fall."

Banks, seeing her plans fall apart around her, protests, but Hayward is implacable. After a few minutes, she stalks away, without the notebooks.

Later that afternoon, Banks gets together with her classmate Paul Larson, and during their conversation, she tells him about her run-in with Hayward.

"Look," says Larson. "Hayward has no right to deny you access to the information in the notebooks. Even if the books should remain in the lab, you did the work that generated all the data."

"I know!" says Banks. "But Hayward wouldn't listen to that argument when I made it."

"Here's my suggestion," says Larson after some reflection. "Just stop by the lab and photocopy the books some time during the weekend. I happen to know Hayward will be out of town, so he'll never know. That's the fair thing to do: He gets to keep the notebooks in his lab, and you get a copy of the data you collected."

Banks seems uncertain, but says she'll think about Larson's suggestion and decide before the weekend.

Should Banks photocopy the notebooks? Why or why not?

Guidelines for Authorship

Outline prepared by Shaké Ketefian.
Reference: Midwest Nursing Research Society (1996).
"Guidelines for Scientific Integrity." Glenview, IL.

Scientists are responsible for sharing results with the scientific and wider community, in order to enable replication, further develop knowledge, and to make it possible for the work to be evaluated for practice and public policy.

Journal publications are an important means of sharing knowledge, establishing a record of achievement in science, and assigning responsibility. Authorship indicates accomplishment and leads to prestige.

Authorship practices are guided by disciplinary traditions, customary practices within research groups, journal standards/policies, and professional standards.

1. Who is an author?
   - persons who contribute substantively to published work;
   - persons who assume public responsibility for the work.

2. What is a "substantive" contribution? A substantive contribution is assuming responsibility for two or more of the following:
   - concept and design;
   - execution of study;
   - analysis and interpretation of data;
   - preparation and revision of manuscript.

3. Other considerations in determining authorship:
   - providing financial/technical support and access to facilities is not a basis for authorship;
   - authorship decisions and ordering should be discussed and agreed upon in advance;
   - if contributions change, initial agreement may need to be renegotiated;
   - status of individuals or rank should not be a basis for authorship decisions;
   - principal investigator assumes overall responsibility for all publications, regardless of authorship status, unless negotiated in advance;
   - all authors review final manuscript;
   - fragmented publications are to be avoided;
   - additional information may be provided to the editor as requested to enable full evaluation of manuscript; examples are: access to original data; designation of each author's contribution; copies of articles by authors similar to manuscript under consideration.

4. Considerations in collaborations between faculty and students:
   - definition of authorship is the same as above;
   - time and effort are not by themselves grounds for authorship;
   - authorship decisions should not be affected by employment status or whether a person is paid for their work;
   - dialogue is encouraged at all points to resolve disagreements.

5. Considerations in all collaborations:
   - teams should determine each member's responsibilities, obligations, degree of participation and contribution;
   - work climate should be characterized by openness and collegiality;
   - there should be mutual accountability of members to one another for carrying out the responsibilities they assume;
   - senior members provide mentorship, training and learning opportunities for junior colleagues and students.

Daily Class Feedback
Academic Honesty at BU

1. Please respond to the following statements by placing a check in the appropriate box.

	High or excellent	Good or above average	Average or neutral	Below average	Poor or none
Your previous experience in today's topic	☐	☐	☐	☐	☐
Your previous level of interest in today's topic	☐	☐	☐	☐	☐
Your current level of interest after performing the exercise	☐	☐	☐	☐	☐
The degree of challenge of today's activities	☐	☐	☐	☐	☐
The degree to which the in-class activities contributed to your understanding of the course material	☐	☐	☐	☐	☐
The ability of the instructor to explain today's activities	☐	☐	☐	☐	☐
The ability of the instructor to interest you in today's exercise	☐	☐	☐	☐	☐

2. Please rate the overall value of the topic covered today according to its 1) relevance to your current situation, 2) interest to you, and 3) applicability to future situations.

Category	High or excellent	Good or above average	Average or neutral	Below average	Poor or none
Relevance	☐	☐	☐	☐	☐
Interest	☐	☐	☐	☐	☐
Applicability	☐	☐	☐	☐	☐

3. In one or two sentences, describe one main point you learned today in class.

4. In one or two sentences, what is the main unanswered question you leave with after today's class?

Thought Paper #4

Due in class the week of Oct 27

After distributing your teaching evaluation to your students, compile the results. Then write a one-page paper describing their responses to your teaching, both good and bad. How will you address their concerns before the semester is over?

Chapter 10
Stress Management for the Graduate Teaching Fellow

What is stress?
Stress usually comes from a lack of time to accomplish a set of goals or tasks. Sometimes this lack of time can come about through ineffective uses of time:

- Procrastination
- Indecision
- Disorganization
- Lack of direction or purpose
- Perfectionism
- Distractions and interruptions
- Parkinson's Law (work expands to fill the time available)
- Fatigue and sickness

Which one of these is the biggest problem for you?

How can we cope with stress?

1. Make a list each day of things you want to accomplish. Plan to do the harder things first and save the easier tasks for the end of the day.

2. Arrange your schedule so that you have blocks of uninterrupted time to get work done – try to arrange these times for when you tend to be most productive (morning, afternoon, or evening).

3. Find time in your daily and weekly schedule for exercise and leisure activities – everybody needs a break and they may even increase your productivity.

4. Differentiate between urgent and important. Urgent things must be done right away, often for someone else.

Urgent and Important Teaching	**Urgent but not Important** Bookkeeping (answering the phone, meetings, email)
Important but not Urgent Research	**Trivial (not Urgent or Important)** Whatever you do that wastes time and reduces productivity

5. Write out objectives, both long-term and short-term, and do what you should to attain these goals. Short-term goals should be attainable, realistic, time-bounded, measurable, and worthwhile.

Long term goals: What do you want to be going 5 years from now? 10 years?

Short term goals: What do you want to accomplish this semester? What should you accomplish this semester?

6. Delegation is one way people get around the lack of time – they give their tasks to other people. As a TF, you probably don't have the power to delegate tasks to others, but you do have the power to say no. Learn to say no. However, if you are asked to take on a task, think about whether that task would fulfill, in part, any of your short- or long-term goals.

Pre-Class Activity: Where does the time go?
Lack of time can also come from taking on too many goals or tasks or underestimating the amount time a task takes. Finding out where your time goes can help you organize your time better. Fill in the first empty column in Table 1 below with how much time you believe you spend on any give task. In class, we will discuss how much time you *think* you spend on these activities each week.

Activity	Weekly Estimated Time	Weekly Actual Time
Coursework		
Preparation/Thinking		
Attending class		
Reading		
Problem sets		
Studying		
Teaching		
Thinking/Preparation		
Giving class		
Office hours		
Meetings/prep sessions		
Grading		
Thesis Research		
Thinking/planning		
Library work		
Reading		
Experiments		
Analyzing data		
Supervision of others		
Attending seminars		
Meetings		
Writing		
Other work		
Personal Time		
Physical exercise		
Meal preparation/eating/clean up		
Relaxing		
Sleeping		
Grooming		
Entertainment		
Personal correspondence (bills)		
Housekeeping/laundry		
Travel time (commuting)		
Family activities		

Weekly Activity: Where does my time really go?
Keep a daily log of the activities you do each hour of the work day in Table 2. Spend about 10 minutes at lunch time, then 10 minutes at dinner each day writing down the activities you performed each hour and how much of that hour was spent on that activity. Then transfer the total time spent on each activity into your log of actual weekly time spent on each activity in Table 1.

Time	Activity	Time	Activity
6:00		**6:00**	
7:00		**7:00**	
8:00		**8:00**	
9:00		**9:00**	
10:00		**10:00**	
11:00		**11:00**	
12:00		**12:00**	
1:00		**1:00**	
2:00		**2:00**	
3:00		**3:00**	
4:00		**4:00**	
5:00		**5:00**	

Source: Young, Xenia. 1995. "Time Management and Survival Skills." Graduate Teaching Development Workshop Series. Cornell University: Center for Learning and Teaching.

Daily Class Feedback
Stress Management

1. Please respond to the following statements by placing a check in the appropriate box.

	High or excellent	Good or above average	Average or neutral	Below average	Poor or none
Your previous experience in today's topic	☐	☐	☐	☐	☐
Your previous level of interest in today's topic	☐	☐	☐	☐	☐
Your current level of interest after performing the exercise	☐	☐	☐	☐	☐
The degree of challenge of today's activities	☐	☐	☐	☐	☐
The degree to which the in-class activities contributed to your understanding of the course material	☐	☐	☐	☐	☐
The ability of the instructor to explain today's activities	☐	☐	☐	☐	☐
The ability of the instructor to interest you in today's exercise	☐	☐	☐	☐	☐

2. Please rate the overall value of the topic covered today according to its 1) relevance to your current situation, 2) interest to you, and 3) applicability to future situations.

Category	High or excellent	Good or above average	Average or neutral	Below average	Poor or none
Relevance	☐	☐	☐	☐	☐
Interest	☐	☐	☐	☐	☐
Applicability	☐	☐	☐	☐	☐

3. In one or two sentences, describe one main point you learned today in class.

4. In one or two sentences, what is the main unanswered question you leave with after today's class?

Part III:

Beyond Teaching in

Graduate School

Chapter 11
Documenting Your Professional Life

There are several ways of documenting the things you have done professionally, but two are commonly accepted at job interviews: the CV (curriculum vitae) and the resume. Other forms may be web sites or portfolios. The kind of document you bring to an interview really depends on the job for which you are interviewing. Academic jobs require CVs and businesses/corporations will ask for resumes. Computer-related jobs may ask to see a web site-style presentation while portfolios may be more typical for jobs in the arts. Before you go to an interview, be sure you bring a document of appropriate style. If it's not in the correct format, they will not even look at it.

A Comparison of Resumes and CVs

For our purposes, you will probably need either a CV or a resume. Both will have similar major sections, which will be described below (summarized from Nancy Borkowski, Office of Instructional Support and Development, University of Georgia, Athens, GA). Each section should be labeled with a heading. Within each section of either the resume or the CV, the activities should be listed in reverse chronological order (most recent first). You should give the dates for these activities, where they were performed, and under the direction of what person, since that person may be one of your references. Finally, for each activity, you should provide a brief description of the duties that were required of you for that activity. A sentence or two is sufficient, and it does not have to be in sentence form. You should use active words in these descriptions. Look in the book "What Color is your Parachute" if you want some good lists of active words. Describe your experiences in a way that shows how they are appropriate to the requirements of the job applicant, without lying or stretching the truth.

CVs and resumes differ in the amount of description you would include about yourself. This means they differ primarily in length. Resumes, historically, were to be only one page in length. Anything important that had to be said about you had to be said in one page. This image of the resume is shifting, and two page resumes are typical. However, you still need to get right to the point because you are essentially trying to justify your fit to a business. Therefore, you would include only the relevant experience you have to a particular job. A CV is intended to show that a person has the relevant experience to be an academic. It takes a lot of experience and many different jobs to make an academic. CVs have no page requirement, and you will find CVs of long-time academics that are 6 pages in length or longer.

Helpful hints

- Proofread your paper. Have someone else read it. Then have another person read it. The benefit to you of a clear, concise paper with no typographical errors cannot be stressed enough.
- Use abbreviations in limited cases. States names can be abbreviated, as well as commonly used biological techniques (e.g. DNA, PAGE)
- Use consistent format throughout the document. Keep the section headings in the same place, in the same font and style. Describe your jobs using similar sentence structure.
- Phrases are better to use than sentences for describing your jobs.
- If you are applying for research jobs, put research experience first. If you are applying for teaching jobs, put the teaching experience first. In short, mold your CV to fit the job.

Resumes

The sections (headings of sections are in quotes) of a resume include:

- A header with your home and present work address, phone numbers, and email address
- "Objective" – one or two sentences stating why you want this particular job
- "Education" – all post-secondary educational experience (from college and beyond)
- "Experience" – jobs that gave you relevant skills to the job for which you are applying
- "Other skills" - Work-related skills (computer skills in particular are good to mention)
- "Interests/activities" – things you do in your spare time that make you interesting
- "References"- optional section, but they will ask for them anyway

CVs

The sections (headings of sections are in quotes) of a CV include:

- A header with home and present work address, phone numbers, and email address
- "Education" – all post-secondary educational experience (from college and beyond). If you have a thesis from your education, give the title of the thesis, the date it was accepted, and the person under whom you worked.
- "Research Experience" – description of all research jobs you have had since beginning college. Describe the major skills you learned from this job (e.g. PAGE-SDS, flow cytometry)
- "Teaching Experience" – description of all teaching jobs you have had since beginning college. Be sure to mention how many sections of the course you taught, how many students were in your sections, and the jobs you performed (grading, designing quizzes, demonstrating equipment, etc)
- "Other Experience" – any lab jobs you had or experiences that contribute to your professional development as an academic. Be sure to describe the specific skills you learned at this job
- "Honors and Awards" – include teaching awards, special fellowships, any other special recognition
- "Grants" – this should be reserved only for grants that are in your name. If you are being paid from your PI's grant, it should be in the "Research Experience" category.
- "Publications" – list all papers that have your name in the author line. It is sometimes helpful to bold your name if it is not the first author. If you decide to bold your name, do it for all publications.
- "Presentations" – both posters and talks at professional meetings and departmental retreats
- "Professional Activities" – list any clubs, committees, and professional organizations that you belong to (BGSA?)
- "References" – optional section

Common Acceptable Formats

Heading Titlexxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

Heading
Titlexxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
Xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

Heading
Titlexxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

Professional Portfolios

You will probably need a CV or resume in the near future as you prepare your own grants or ask a faculty member for a recommendation. But once you enter the job market, you may consider preparing a Professional Portfolio. This portfolio basically allows you to go into much more detail than you would in a CV. It's good to do it now, mainly because it is a handy way to keep track of all of those important, professional papers. People on the faculty track should definitely prepare a professional portfolio. As a faculty member, you will be asked to present a professional portfolio to the promotion committee for all promotion and tenure decisions.

If you make a professional portfolio, get yourself a nice, three-ring binder (the leather, or faux leather binders are nice) and some plastic cover sheets. All of the documents that make up a professional portfolio should go in this folder. Each section should be on a separate page.

- CV
- Teaching philosophy (1-2 pages; for faculty or teaching jobs only)
- Detailed description of research jobs (1-2 pages)
- Detailed description of teaching jobs (1-2 pages) – I recommend you include this even for non-teaching jobs since you learn a lot of transferable skills as a teacher; you should highlight that. Describe the courses as well as your responsibilities so that you can give the reader an idea of the environment – the types of students, the topics covered.
- Detailed description of teaching activities (1-2 pages) – include this section if there are things you did related to teaching that were not specifically a class you taught (e.g. wrote a chapter of a lab manual, designed a web page for a class, prepped a lab you don't teach)
- Highlights of class evaluations – in the new pc world (politically correct, not personal computer), this is now called "student ratings of teaching." I include both "good" and "bad" evaluations to show an even picture of myself, and I try to highlight improvement in my teaching. If you have them, include the numerical ratings of specific qualities, as well as specific comments.
- Photocopies of awards, thank-you notes, grant award letters
- Reprints of papers

Teaching Philosophy Statement

Why do you have to write a teaching philosophy? Statements of teaching philosophies are becoming a common requirement of faculty in the hiring and promotion/tenure processes of many universities. But more personally, writing down your teaching philosophy allows you to think about your role as an instructor and how it fits into your professional development and goals. Teaching philosophies are never static, requiring revision and rewriting as you learn about yourself as a teacher.

The statements below are guidelines for the kinds of information that should be in a teaching philosophy statement. You should feel free to put more or less emphasis on whatever topics you choose. Teaching philosophies should be personalized and never written in the passive voice. People read your philosophies because they want to know about YOU as a teacher and how YOU intend to contribute to your institution.

In-Class Activity: Brainstorming a Teaching Philosophy

We will work on brainstorming ideas about what your teaching philosophy should say. Answer the questions below, and then we will discuss what we have responded to each question. We will be sharing our ideas because some teaching fellows may verbalize ideas that will give you ideas about your own philosophy.

- Two sentences describing how you view teaching in your discipline from a professional and personal point of view.

- One sentence about what teaching means to you for your own professional development.

- One sentence describing your learning and developmental objectives in relationship to the students in your class.

- One sentence linking your philosophy of teaching with pedagogy (why do you choose the teaching methods you use?).

- One sentence on how you will improve your teaching.

- One sentence on how you will improve the learning in your classes.

Daily Class Feedback
Documenting your Professional Life

1. Please respond to the following statements by placing a check in the appropriate box.

	High or excellent	Good or above average	Average or neutral	Below average	Poor or none
Your previous experience in today's topic	☐	☐	☐	☐	☐
Your previous level of interest in today's topic	☐	☐	☐	☐	☐
Your current level of interest after performing the exercise	☐	☐	☐	☐	☐
The degree of challenge of today's activities	☐	☐	☐	☐	☐
The degree to which the in-class activities contributed to your understanding of the course material	☐	☐	☐	☐	☐
The ability of the instructor to explain today's activities	☐	☐	☐	☐	☐
The ability of the instructor to interest you in today's exercise	☐	☐	☐	☐	☐

2. Please rate the overall value of the topic covered today according to its 1) relevance to your current situation, 2) interest to you, and 3) applicability to future situations.

Category	High or excellent	Good or above average	Average or neutral	Below average	Poor or none
Relevance	☐	☐	☐	☐	☐
Interest	☐	☐	☐	☐	☐
Applicability	☐	☐	☐	☐	☐

3. In one or two sentences, describe one main point you learned today in class.

4. In one or two sentences, what is the main unanswered question you leave with after today's class?

Thought Paper #5

Due the week of Dec 1

Write a teaching philosophy, using the description provided on the previous page, the answers you provided to the questions, and any ideas you got from other teaching fellows during the discussion. As this is a relatively personalized statement, there are not many rules for writing one. You may draw upon previous experiences to explain how you arrived to be the teacher you are, you may use motivational quotes, but it's up to you how you want to write your teaching philosophy.

Code # _____

BI 699 Post-Course Evaluation

1. To what extent do you think that this workshop improved undergraduate learning in your course?

Significantly	Quite a bit	Some	A little	Not very much
☐	☐	☐	☐	☐

2. The following is a list of skills and topics that were discussed during this workshop. Please rate the skills as to how important you believe each is to your success **as a teacher**.

Skill	Essential	Important	Neutral	Minor	Irrelevant
Effective public speaking	☐	☐	☐	☐	☐
Maintaining an effective learning environment	☐	☐	☐	☐	☐
Designing interactive learning activities	☐	☐	☐	☐	☐
Relaying information in different ways	☐	☐	☐	☐	☐
Giving meaningful feedback to foster learning	☐	☐	☐	☐	☐
Understanding ethical academic behavior	☐	☐	☐	☐	☐
Managing time	☐	☐	☐	☐	☐
Documenting professional activities	☐	☐	☐	☐	☐

3. Rate the skills below as to how important you believe each is to your success **as a graduate student**.

Skill	Essential	Important	Neutral	Minor	Irrelevant
Effective public speaking	☐	☐	☐	☐	☐
Maintaining an effective learning environment	☐	☐	☐	☐	☐
Designing interactive learning activities	☐	☐	☐	☐	☐
Relaying information in different ways	☐	☐	☐	☐	☐
Giving meaningful feedback to foster learning	☐	☐	☐	☐	☐
Understanding ethical academic behavior	☐	☐	☐	☐	☐
Managing time	☐	☐	☐	☐	☐
Documenting professional activities	☐	☐	☐	☐	☐

Code # _____

4. Rate the skills below as to how important you believe each is to your success **in your future career**.

Skill	Essential	Important	Neutral	Minor	Irrelevant
Effective public speaking	☐	☐	☐	☐	☐
Maintaining an effective learning environment	☐	☐	☐	☐	☐
Designing interactive learning activities	☐	☐	☐	☐	☐
Relaying information in different ways	☐	☐	☐	☐	☐
Giving meaningful feedback to foster learning	☐	☐	☐	☐	☐
Understanding ethical academic behavior	☐	☐	☐	☐	☐
Managing time	☐	☐	☐	☐	☐
Documenting professional activities	☐	☐	☐	☐	☐

5. What is your general attitude towards the value of this learning-to-teach workshop?

(Very positive) 5 4 3 2 1 (very negative)

Please briefly describe your response below.