

## Chapter 11 — Teaching Contexts

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Elsewhere in this handbook we have covered effective lecturing. Here, we present other teaching contexts. While the dynamics of the student-instructor relationship and the criteria used for improving it remain essentially the same as in traditional situations, additional points should be considered.

- **Teaching Strategies for Large Classes**
- **Teaching the Discussion Class**
- **Teaching in the Laboratory**

### **Teaching Strategies for Large Classes**

#### **Creating an Interactive Environment**

It is essential to be enthusiastic and to have students answer specific questions during the lecture to keep them engaged.

- **Personalize instruction** -- You may know some of your students from enrollment in a previous class or a student organization. Use this already established relationship through casual remarks before and after class, and expand the nonverbal inclusion of others in the exchange.

There are many ways in which a teacher can attempt to make a large class more “personal.” In general, these methods take time but are appreciated. Some strategies include the following:

- o Learn students’ names. Use the **Photo Roster** to connect names with faces. Ask students to say their names before they respond to a question, and spend a few minutes after class memorizing them. Learning a small percentage of names in a large class gives students the impression that you are trying to connect with them.
- o Ask them to tell something about themselves on the back of an information card, which you can distribute on the first day. Also, your course website is an excellent place to collect information from a “Get to Know You” survey, which will also foster a learning community.
- o Emphasize willingness to talk outside of class by appointment, not just during formal office hours. Or, if you have a course website, use the online communication tools supplied. E-mail, group e-mail, and threaded discussion are all features that support communication.

- **Create a safe environment** -- To encourage student involvement, talk about questions students have raised in previous terms.
  - o “Do you know the first thing students typically ask when I present this problem?” Or, the phrasing can be more specific.
  - o “I had a student once who asked me such and such, and that is really an excellent question.”

Talking about student questions from previous semesters is a simple technique, but it does say to students that the questions they raise are relevant and demonstrates your eagerness to respond to their queries.

Consider developing a Frequently Asked Questions (FAQs) section on your course website.

If a student asks a particularly insightful question after class or in an office session, the student can be recognized in class with a comment like, “Jim asked me an excellent question yesterday. In fact, it is so good I’d like to take a few minutes in class to discuss it.”

Students are sometimes helped when a professor acknowledges that a concept is confusing. Explain your first encounter with the idea. What strategies and techniques helped you to clarify the concept?

- **Use humor** -- Humor can do much to communicate messages of “humanness.” Use it in ways that are natural and comfortable expressions of your individuality. Most important, do not be afraid to laugh at yourself. If you make a slip in pronunciation or drop three pieces of chalk in a row, and your behavior makes students smile or even laugh, join them. Never use sarcasm; it can too easily backfire if misunderstood.

## Dealing with “Lecturing Anxiety”

There are several points to keep in mind when you are trying to reduce the anxiety of lecturing before a large number of students.

- Most students will not recognize how tense lecturers are, especially if lecturers appear confident. Confidence arises from careful and thorough preparation. Knowing the material allows you to focus on students’ reactions and to perceive when they are engaged and when they are confused.
- Many lecturers are their own worst critics. Focus on the material to be conveyed and the students’ reactions.
- Some nervousness is helpful because it gives you an edge

and a sense of spontaneity, anticipation, excitement, and alertness.

- Nervousness will decrease with experience.
- For those with chronic anxiety problems, there are numerous treatment programs available. The Center for Teaching & Learning at 644-8004 or the Employee Assistance Program at 644-2288 can advise you as to who can give you assistance.

## Lecturing in Large Classes

Be prepared! Plan the lecture thoroughly, allowing adequate time for discussion of the necessary topics. Few results are worse than running over time and having 200 people walk out on you.

- The lecture should not be used to convey information that can be more efficiently acquired in other ways such as through texts, other books, online, additional printed materials, hyperlinks, or audiovisual aids. Nor should it be a repetition of material in the text or assigned reading, which is an insult to students. They will quickly realize the uselessness of attendance.
- An interesting exercise for instructors of large classes who wish to monitor students' perception of lecture content is to view a sample of student notebooks, and then compare them with each other and with your notes.
- Efficacy can be improved by having students spend a few minutes discussing among themselves what has transpired after every 10 minutes or so of lecture. Another method is a structured lecture in which there are 20 minutes of lecture, followed by 10 minutes in which students work in teams on a particular problem, followed by another 20 minutes of lecture.



## Suggestions for Successful Lectures

- Start the lecture on the right foot by allowing students a few minutes of adjustment time to get settled. If you put your key sentence first, they will probably miss it.
- Start the lecture with a non-critical item so that they know you have begun. Provide a brief review of major points before lecturing so that students can still interact with the lecture even if transitions are weak. For clarity and retention, outline what you will cover, cover it, then review or summarize what you just covered.



**Example** -- One professor uses overhead projectors to present a relevant news item or article for students to review

as they find their seats. She then begins the lecture by referring to these articles, which emphasize the relevancy of the topic of the day (thereby, using the opening minutes of the class very effectively).


- Provide an outline of the main points of the lecture on the overhead projector or chalkboard. This outline can be presented to students in the calendar of a course website.
- Include no more than three or four main points in a 50-minute period.
- Begin by posing a question or example.
- Clearly delineate major points verbally (“The next point is....”) and stand by the lectern in a relaxed posture.
- Write out unfamiliar terms, names, or references on the board or transparency. Intersperse concrete examples of general concepts for clarification. Also include these on the course website.
- Involve students as much as possible. Use topics as online forum discussions over the coming week or the prior week.
- Be enthusiastic.
- Adapt lecture material to your students. Share information with them that concerns them and provide examples that relate to their issues and concerns.
- Cover a few points in-depth rather than many superficially.
- Interest comes from variety. Try to assemble facts as well as examples, opinions as well as illustrations, statistics as well as anecdotes. A variety of material captures attention.
- Vary format and move around. Use visual aids.
- Use humor that emanates naturally from the material and setting.

### **Interaction and Discussion**

Some instructors use small groups to manage interaction in large lecture classes. Some points to consider in helping small groups work well:

- Use clear, simple, and task-oriented instructions, such as:
  - o “Decide together which of the brothers is the major character in the novel and why.”
  - o “Identify three positive and three negative qualities of King David’s character.”
  - o “If you were Lincoln, what would you do about Fort Sumter?”

- Give groups a sense of how much time they have to do their work, as in, “Take ten minutes to define your group’s position.”
- Ask groups to select a recorder and provide clear ways of reporting back.

 **Suggestions** – Student reporters tell the instructor orally and he writes responses on a blackboard; reporters write responses on a transparency; reporters write responses on cards that are collated and read by the instructor. Another group member can be responsible for posting outcomes to the course website for future reference and review.

### **Make Instructions Specific and Concrete**

Group activities can work well in large classes with advance planning. Attention to detailed instructions is essential. Group tasks must be specific and concrete.

- “Groups should generate four possible explanations for the results we’ve just observed.”
- “In five minutes, I want each group to have a list of three items.”
- “Here’s the statement... I want to know if the group agrees or disagrees and why.”

When tasks are not specific or clear, group members must try to decide what it is they are supposed to do. When this occurs, time is wasted in confusion, complaining and, often, socializing instead of working on the assigned task.

### **Monitor Time and Group Size**

In large classes, group projects work best if they are brief and to the point, something quick and easy that adds presentational variety. The time allotted must be proportional to the task, but five minutes can be enough to work on a well-defined problem. Keeping the time limited also forces groups to focus on tasks quickly. Shorter times work well if group size is kept small -- no more than three to five people, or, on occasion, people can work in pairs. Group size is also proportional to participation. It is tougher to be a silent member when there are only two other persons in the group.

### **Do Something with Group Products/Results**

No one likes to contribute to an activity only to discover that the results are disregarded. If students have worked on solving a problem, ask the groups for the answer. If different answers are offered, that is better. Have group members defend and explain

answers. Alternative answers and solutions can be recorded and posted on the course website or on the board during class.

## **Writing Assignments for Large Classes**

Consider the following ways to structure writing assignments for large classes:

- Assign term papers with due dates for the different segments that combine to result in a complete paper -- an abstract or summary, an outline, an introduction, main arguments with bibliographic references, a conclusion and then, finally, the entire paper can be due, all at appropriate intervals.
- Assign shorter forms of written work from all students to fulfill Gordon Rule requirements (e.g., reaction papers, reading journals, position papers, laboratory or observational reports).
- Assign group projects that will produce a smaller number of written products to grade. These can be assigned online in threaded discussion forums and can be monitored throughout the students' progress. Products can be posted to the website for all to view. The instructor can monitor fewer actual projects while including all students in the interaction thus produced.
- It is essential that the length of students' answers be limited if essay exams are to be used in large sections. Good ways to limit students' answers include focusing the questions somewhat more than you would in a similar but smaller class, encouraging students to be concise, and giving students a limited amount of space in which to answer.
- It is especially easy to be passive in a big class. Instructors must make special efforts to engage students. Conclude a lecture by proposing, "Take two minutes and generate a test question on today's content that you think you might see on an exam." You might just get a good question, and if you do decide to use it, students will take that segment of class seriously. These can be requested as hard copy at the end of class or be required to be posted by midnight that day on the course website.
- You can encourage quiet students to participate in discussions by writing. For example, you might say, "Please quickly write down five possible..." and then call upon a generally hesitant student for a response. The written aid will help that student make a comment. Online discussions often draw out the more reticent student since she can be thoughtful about a response and not be the focus of the

attention of an entire class.



**Suggestion** -- At the start of each class, students write for five minutes in response to a question about the assigned reading for that day. Grammar, mechanics, and organization do not count. Papers receive an “S” or “U,” the only criterion being that they must demonstrate beyond a reasonable doubt that they have read and thought about the assigned reading. This method eliminates the need to take attendance or grade quizzes and encourages regular attendance and timely reading of assignments. If you have a web-supported course, this technique, which requires interaction, can be used in online threaded discussions.



**Related Chapter** – For further information on writing assignments, see “Writing Assignments and Their Evaluation” in **Chapter 13 – Grading**.

## Large Class Management

- **Latecomers** can be distracting to both the instructor’s train of thought and to student attentiveness. With large classes, it seems that someone is always arriving late or leaving early. You cannot eliminate this entirely, but you can minimize it. A punctual instructor who arrives a few minutes early to set up and who begins promptly sets a good example. Indicate from the outset that tardiness is unacceptable. Use a glance, a dramatic pause, or verbalize your concern early in the semester. Do not hope the problem will go away and then, eventually, respond angrily out of annoyance. The latter response will be ineffective in curing behavior that is better prevented.
- **Backpack zippers** -- The last few minutes of class is a common time for student attention to wander, and the zipping of backpacks interrupts the flow of class. A well-timed remark might be effective. Say, with a smile, “You have four more minutes for which you have paid, and I shall end promptly, so just wait to grab your back packs.”
- **Reading newspapers/non-class related material** -- If you find reading the newspaper or any other behavior distracting, it is best to say or do something at the first instance of the behavior.
- **Your professional image** -- Look at yourself in a mirror. Does your appearance reflect a relaxed or a formal attitude? It has been observed that if instructors project a more formal, professional appearance, students react in a more formal way in the classroom (i.e., less talking, less coming and going, etc.). On the other hand, if the instructor is more relaxed or informal in appearance, it is likely that the

students will feel less inhibited about talking, leaving early, etc. While appearance makes the first impression, it can be counteracted or enhanced by preparation, confidence, interaction, enthusiasm, inclusiveness, and fairness.

- **Student feedback** -- Instructors need diagnostic, descriptive details indicating student perceptions of the learning experience.
  - o Do the lectures facilitate note taking?
  - o Is the pace manageable?
  - o Do the readings make relevant contributions to understanding course content?
  - o Does your style of presentation hold attention most of the time?
  - o Are the examples relevant?
  - o Are there enough examples?
  - o Is the value of the course content clear?

Data like this can be obtained through an instrument administered by the instructor -- an instrument that asks what you are most interested to know. (See **Chapter 14 -- Improving Your Teaching with Feedback.**)

Open-ended questions can be focused. To create a list of specific suggestions to be considered for implementation, ask a question such as, "When do you find yourself most/least intellectually stimulated in this course?" These brief surveys can be conducted online for more immediate feedback to instructors.

Minute papers are effective for getting feedback -- "What was the most useful/meaningful thing you learned during this session?"

### **Other Techniques for Management**

- The large-class lecture setting provides an opportunity to practice an old-fashioned but woefully ignored technique: explication. Instructors can teach students how to read, even in large-lecture classes, by going directly to a text and reading and analyzing passages with them. The students, following along in their books, observe the professor working through a passage. Students are then ready to do it themselves. Invite students, either ahead of time or at the start of class, to "find one or two quotations from the text which you found significant." This is an activity that can also be supported online in the course website.
- Include a list of study questions within your course

objectives. Each day begin the class asking one of the questions -- you may want to give the students five minutes or so to write down their answers. Then encourage students to share their answers with the rest of the class. This activity can also be a weekly activity online. It will prepare students for a lecture or can supplement other online activities.

- Do not overlook the flexibility provided in the online course management system (Blackboard) supported by FSU. There are many ways to communicate with and among students online. They can collaborate in small groups and you can monitor the activity, interjecting encouragement or correcting the course as necessary.

### ***Teaching the Discussion Class***

A discussion class is a small sub-group of a large lecture class, which meets regularly as a supplement to the weekly lectures. It can also be a small group formed online to work collaboratively either as part of an online course or as an activity that supports a course taught in the classroom. These are both subsets of the larger class, irrespective of class size.

While the once-per-week discussion or recitation class is common to math, science, and the social sciences, all disciplines will have occasion to use collaborative group discussions in online courses or as activities that supplement classroom activities. Generally, the lead faculty member for the course will determine the purpose of the discussion class or online group. Discussion group leaders such as mentors, TAs, or faculty facilitators have the responsibility of guiding and monitoring the discussion group appropriately in keeping with the instructor's purpose.

### **Identifying the Purpose and Goals of the Discussion Class**

The purpose of the group discussion must be determined during the course design. Facilitators will rely upon the lead instructor to guide them in using the group discussion period or online function in accord with the goals and objectives of the course. These should be clearly indicated in the course syllabus. Facilitators should communicate with the instructor to ensure that they clearly understand the purpose of the group activity. The students will use this time appropriately only if the monitoring person clearly conveys and supports the goals.

Consider:

- Is the discussion period or activity to be used for reviewing and explaining the material already covered by the lecture?
- Are students supposed to work together on homework

problems?

- Are you expected to introduce new material, or are you expected to broaden the students' ideas of specific aspects of the lecture materials?



**Related Chapters** – See Chapter 2 – Determining Learning Objectives and Chapter 3 – Creating a Syllabus.



**Resource** -- Our [Leading Discussions Tip Sheet](#) gives quick tips, from motivating students to participate to concluding the discussion. Download and print the document for easy use.

### Deciding What to Cover During the Discussion

If there is to be an effective discussion, it is essential for a facilitator to have a firm grasp of the course readings, labs, and lectures. It is crucial to have the same exposure to course materials and presentations as students. A lot of time and effort can be lost if assumptions are made about particular lectures or presentations. Appropriate guidance of discussion activities can only occur in the context of the course activities and materials to which the discussion relates.

- Although the course syllabus provides a general idea of what is being covered in class, **only attendance at the lectures will provide the necessary framework for group work**. Attending each lecture ensures awareness of potentially confusing events in the lecture (e.g., a misinterpreted word or phrase, a poorly presented chalkboard demonstration). Furthermore, if the intent of the discussion is to delve more deeply into lecture material, a first-hand experience of the presentation will enable a facilitator to focus and guide discussion appropriately. In the online course, facilitators should work through assignments ahead of schedule and communicate with the lead instructor to ensure compliance with goals for the discussion board.
- **Attending lectures serves as a beneficial review of the basic materials** that are required to teach your course or any advanced course in your subject. Often, advanced graduate students or experts in the field are surprised to find that the more complex problems they consider to be interesting are not really of interest to an undergraduate in an introductory course. Participation at the undergraduate student's level will help the facilitator better understand the student's current experience with the course material.
- **Attending lectures provides an opportunity to observe a more experienced instructor**, one you may (or may not) choose to use as a model in the future. After attending the

lecture or completing online assignments, you should critique the experience. Were all points clearly and comprehensively explained? If so, the next discussion class may include a quick review of some of the main issues, followed by an application or extension of the idea. If it was not a particularly good lecture or activity -- muddy explanations, confusing organization, too many irrelevant digressions -- the next discussion should clarify, focus, and develop the assigned material. It is important, however, to be prepared in the discussion to answer *all* questions, not just those that you think will present problems.

As one Physics department instructor pointed out, “Be prepared for the worst. If you go to class having prepared 95% of the problems, you can be sure that a student will have a question about the problem you did not do. And that problem will be a tricky one.”

### Getting Students Involved

How to get students involved in discussion classes also must be considered. Be sure that students know at the beginning of the semester what the purpose of the discussion class is, that it is not just a rerun of the lecture. Usually, it is an opportunity to address problems students may not thoroughly understand, to broaden their knowledge of what is already understood, and to give them some practice in applying the knowledge and skills they have learned. Demonstrate that you are sensitive to their concerns. Let them know that their input will help shape discussion topics and activities.



**Related Chapter** -- For more strategies on getting students actively involved in discussions, see **Chapter 8 – Using Active Learning in the Classroom**.



### Suggestions

- A good way to get everyone in the class involved is to ask students to come to class with a question they would like to have answered. In the case of face-to-face discussion classes with a web-supported component, their queries can be anticipated by engaging in a brief online threaded discussion, or, if there is no web-supported component to the course, an announcement can be made prior to the discussion period. The face-to-face experience can be shaped and anticipated by prior communication. Questions or concerns collected online or brought to class can be written on the chalkboard at the beginning of the discussion activity. This will only take a few minutes, and it will give you an idea of the type of problems students are having. Students can see what problems others

are having, and it will give them a sense of participating in the shaping of the class. As you write the questions, group them according to subject matter. You will find that, quite frequently, several students will have the same problem.

- An alternative way of involving students in discussion is by outlining on the board the topics you think need to be covered and having the students decide which they find most urgent. This can also be communicated online prior to a face-to-face meeting. This method has the advantage of giving you more control over the content of the class while still allowing the students some voice.

[Adapted with permission from *The Teaching Assistant Handbook*. (1989). Teaching Assistant Project, The Graduate School, Rutgers University: New Brunswick, NJ.]

## **Teaching in the Laboratory**

Laboratory classes are taught in many different disciplines across the University. These suggestions are meant to be generally applicable.

### **Preparing for the Lab**

There is much to coordinate in a laboratory class. Not only must you know the material, you must also supervise and guide students through the lab. Preparation for labs will necessarily be a large part of your teaching effort. Efficient preparation is desirable for any lab facilitator, so take advantage of all available resources. TAs can ask for advice from experienced graduate assistants or lab assistants who are familiar with the lab. Their advice could save time, effort, and even occasional embarrassment.

**Important:** Establish communication with the lab manager or managers. Many issues regarding equipment, supplies, and condition of the lab prior to and following class can be discussed and protocols agreed upon in advance.

### **General Preparation for All Lab Meetings**

- **Read the assigned lab activity in the lab manual** (if you are not the instructor who created the activity). Know what the students are supposed to learn and why. Look up any terms or concepts that are unfamiliar to you or your students. Familiarize yourself with the subject relevant to the lab activity by reading the course text or reference books and bringing them to the lab for student use. Be certain that you feel comfortable and knowledgeable about the material before lab. Also, keep abreast of the corresponding lecture or online activities as written in the syllabus. If it is possible

for students to take the lab without being concurrently enrolled in the lecture, find out which students are doing so. Most likely they will require more orientation or should be paired with students currently enrolled in the lecture section.

- o Some labs may benefit from supplemental materials, especially those that consist solely of demonstrations (e.g., botany and geology sections). If the lab manual does not contain such materials, students may find it helpful if you prepare a handout to guide their observation. Alternatively, you can communicate with students online to prepare them and to field questions prior to the lab experience. Online communication can be useful in identifying challenges, which will prepare you for the face-to-face lab experience.
- o Obtain a syllabus and textbook for the lecture (or the relevant lecture course) so you know where your students are in the lecture sequence. If a lab takes place before a relevant lecture, you must take this into account, as students will not yet have had the theory. This is an excellent opportunity to prepare students by providing online orientation to the theory.
- **Know your equipment.** Check that all the relevant equipment is available and in the appropriate location (consult the equipment lists as needed). Know how to use the equipment safely and efficiently as well as where to find more should you need it. Be familiar with how to turn equipment on and off, what constitutes breakage or failure, where to find a replacement or how to restructure the lab without it. Make certain that students know how to take care of the lab and their assigned equipment. Labs will function more smoothly and safely when students share responsibility for set-up and clean up.
- **One week prior to class, if possible, actually perform the experiment and analysis.** The benefits of preparing the experiment in advance cannot be overstated. Running through the protocol allows you to anticipate and plan for problems. As you do the experiment, pay attention to the clarity and completeness of the lab manual. You may need to warn students about possible pitfalls or supplement the manual with instructions or handouts.
  - o **Think about equipment and supplies.** What and how much will you need for your students for the particular lab exercise? Will you need to schedule class activities to avoid long waiting lines in that particular lab for a crucial piece of equipment?
  - o **Run through the data analysis with your trial data.** Keep a record to refer to during lab, and include units and necessary equations since many students have

difficulty with these. Finally, know whether you can obtain the expected result. Plan for alternative strategies for the times that results go awry.

- o **Make a list of anticipated student questions and your responses.** Labs are experiential and often the best response to a question is to pose another question. What questions will help students do their own problem solving? In labs, these usually refer to given, or known, information, or reviewing observations. If you can, shadow an experienced lab instructor. You should hear typical questions and answers relevant to that day's lab exercise.

Many large courses have weekly preparatory sessions with lab facilitators and the course supervisor (occasionally the lecturer) attending. "Prep" sessions have many advantages over individual preparation. When doing the lab as a group, you can preview the experiment and lab manual; the experience will have more of an actual classroom atmosphere. As a group you can decide what to emphasize across sections and discuss how to solve difficult situations from a variety of perspectives. This is also a wonderful opportunity to learn from others who are experienced with the lab.

If this is not a usual practice, efficient preparation can be managed by online communication among facilitators, lab assistants, and the instructor. At the least, tips from more experienced persons can be shared with others tasked with lab oversight.

- **Think about time management.** When preparing the lab, keep in mind the length of time particular tasks will take. What should students be doing after a half hour, an hour, three hours? Try to anticipate any problems your students will have in budgeting their time on various sections of the experiment. Guide and pace your students so that all of them finish on time (or approximately on time). Sometimes you can subdivide lengthy labs, with different groups carrying out different sections. In some cases, you may need to do parts of the experiments or give a group demonstration.
- **Think about safety.** Review the safety concerns presented by the lab and plan what you need to do to reinforce these concerns for students. Provide them guidelines prior to the lab meeting by e-mail or, if a web-supported course, by an online course announcement. Be aware of any health-related problems that students might have that require special consideration (allergies to chemicals, students who need rest breaks because of health, etc.).
- **Plan for student preparation and write-up.** There is

nothing more frustrating than repeatedly answering the same questions because students did not read the lab manual. In addition, unprepared students in a lab take longer and make more mistakes. Some options to help students prepare include the following:

- o **Assign advance readings**, with guiding questions to focus their study. If your course is web-supported, this can be done via online communications in a threaded discussion format to include all students. If it is not web-supported, you can distribute a handout in the class prior to the lab.
- o **Give short quizzes** of two to three questions at the beginning of the lab (students can grade these).
- o **Briefly discuss the key lab procedures** and outline them on the board or on a handout.
- o **Pose questions** to students randomly during the lab introduction.
- o **Require pre-lab write-ups** of an introduction or purpose of the lab for students to include in their lab notebooks.
- **Plan your introduction and closure.** Review and think about the goals of the course. Relate and integrate them into the lab activities.
  - o What concepts must be introduced or reviewed to make the lab material relevant? What is the lesson(s) to be learned from the lab and how will the students understand and retain it?
  - o Where appropriate, a brief, well-prepared demonstration can be informative.

Introduction and closure are extremely important and your presentations should be short and to the point. Remember, students are there to get their hands dirty, not to listen to another lecture.

Take a few minutes at the end of lab to review the goals, and discuss results and difficulties. A group analysis and comparison of results helps students experience the realities of the scientific process.

## Checklist for Pre-Lab Preparation

- ❑ Work through each experiment yourself, including data analysis, so you will have a thorough understanding of it. Your models can become instructional aids.
- ❑ Read and study the textbook and theory on which each experiment is based so you can answer students' questions.
- ❑ Figure out where students may have problems with the experiments. You might also ask persons who have previously taught the lab.
- ❑ Ask the instructor and/or facilitators who have previously taught the lab which experiments have constraints or confounding conditions, e.g., weather dependence, the lecture sequence of the topics, or are tied to other courses.

### The First Lab Meeting

Careful thought and planning are essential for the first lab class. This is the time to set the tone for the rest of the term.

- **Encourage the students to get acquainted with you and one another.** Introductions could include major, hometown, special interests related to the lab, information about current enrollment in the related lecture course, etc. Begin to learn students' names; keeping a list with related information can be an aid.



**Suggestion** from a facilitator in Physics:


Facilitators also need an introduction to the students. I generally ask people why they are taking the course -- pre-med, pre-dentistry, other health professions, engineering, physics major, etc. (Three out of 300 took my course for "fun.") Another facilitator hands out index cards asking students for name, method of contact (e-mail, phone number, beeper, etc.), and one "interesting personal fact" to help him remember names.


- **If course design requires that students work in groups, it is important to form the groups** and encourage members to become acquainted with each other. You may have a simple experiment for them to do on the first day that would require them to work together so that they begin to get to know each other as collaborators and resources in a learning context. These newly formed acquaintances can be reinforced by required online communications between lab meetings.
- **Help students to understand the relationship of the**

**laboratory section to the overall course**, and point out that most of the experiments are intended to illustrate basic ideas that underlie fundamental concepts presented in the course. Briefly review the types of experiments the students will be performing. Emphasize the importance of arriving at the lab on time due to the need for orientation and guidance prior to the beginning of actual experiments. Show them the laboratory facilities and give them a few minutes to become familiar with their surroundings.

- **Prepare a handout** (with the information in the first 3 bullets above) or include this information in the syllabus or on the course website. Other issues that should be written on a handout and communicated on that first day include:
  - o The importance of laboratory safety measures
  - o A complete list of safety rules
  - o Notification that students with physical or other impairments who require special consideration must make a request for this consideration. (The student must also inform the Student Disability Resource Center, 644-9566. You cannot inform SDRC on the student's behalf.)
  - o Detailed explanation of the general ground rules for the proper handling and storage of supplies and equipment, including clean-up procedures following the lab meeting
  - o List of the manuals and supplies the students will be expected to purchase and where these may be obtained
  - o Explanation of preparation required for each session
  - o Review of the overall grading policy that is in place
  - o Discussion of expectations regarding independent and collaborative work
  - o Explanation of the format for notebooks and reports the students will be expected to keep (Provide sample notebooks and reports.)
  - o Any ground rules such as:
    - \_ Attendance policies
    - \_ Late report submission policies
    - \_ Lab make-up policy
    - \_ Policies on cheating and plagiarism
  - o Discussion of the assignment for the next laboratory session
- It is important to distribute a handout that specifies these policies and guidelines. This is important for several reasons. It gives you and the students a written record. Students joining the class after the first day do not miss this important information, and, if disputes arise later, you will have documentation. Bring copies to subsequent classes for

those who do not attend on the first day. Post these guidelines on the course website.

 **Suggestion** -- Seek experienced lab facilitators in your department for more ideas on what specifically needs to be emphasized or explicitly explained on the first day.

 **Related Chapter** – For examples of issues and policies that should be covered in your syllabus, review **Chapter 3 – Creating a Syllabus**.

## Running the Lab

With your preparations finished, everything is in place and ready to go for the students. Here are some suggestions for structuring the lab period.

- **Go into the lab early and write a brief outline of what is to be covered on the board.** This helps keep students focused, helps pace the work, and is especially important for classes that might have multiple, ongoing experiments. Include pertinent announcements (review and exam dates, assignments due) to avoid spending too much time on these during class. This and other relevant information can also be posted on the course website in Announcements or as part of a discussion forum. Or, you may wish to put this information in a handout for the students.
- **Begin lab on time.** Waiting for everyone to show up only encourages latecomers. Consistent promptness can inspire everyone to arrive on schedule.
- **Briefly summarize the results of the previous week's lab.** Summarizing is important for continuity throughout the semester. This should also be done online prior to the current lab meeting.
- **Give a brief introduction to this week's lab.** Here you can give any announcements, answer questions about lecture, and introduce the lab. Be concise. Again, advance organization by way of online announcements and summaries can be valuable in preparing students.
- **Demonstrate any tricky techniques or apparatus and point out the location of special materials.** Gather the class close together for this demonstration, making certain everyone can see and hear. Encourage questions, but ask your own to monitor understanding, which will help you avoid explaining the same thing ten times in the first half hour. Have students form lab groups now if this has not already been accomplished online or as part of the course design.

- **Interact with students.** Take an active role with your students. “Learn and use their names” bears repeating because of its importance. Try to interact with everyone during the period. Move through the entire room. Check notebooks and make suggestions, eavesdrop on discussions or read over students’ shoulders. This way you are readily available when questions come up and you can steer students in the right direction if they have gone off course. Such vigilance can help you quickly see particular challenges that can then be addressed to the entire class.



**Suggestion** from an international instructor:

I am not very good with names and faces, but every semester I have made an effort to know all the students’ names by the third week of school. That is tough for international instructors but it helps a great deal.

- **Never pretend to know the answer to a question.** If you do not know the answer, look it up in a reference text, or ask another facilitator or the course instructor. Students will respect your honesty and will trust the correct answers that you do give. Describe to students your methodology for finding an answer. This can help them learn how to search for answers independently. Such tips encourage and support active learning on the part of students, a worthy goal for any instructional activity. Remember to find the answer and provide it to the class online and/or at the next lab meeting.



**Suggestion** from a Physics instructor:

Students will often not ask questions. Constant circulating among the students is needed. Lots of questions come forward on an individual basis. I would ask how it was going, what certain results showed (concepts proven), or if there was another way to do something. Nine times out of ten doing this elicited good, thoughtful questions.

- **Let students take responsibility for learning.** De-emphasize the “teacher as expert” model. One purpose of a laboratory section is to teach students how to learn through experimentation; in other words, how to do science themselves. It can be hard to know where to draw the line between effective hands-off teaching and letting the class drift aimlessly. Have a procedure for encouraging students to be their own resources and follow it. For example, you might require students to pose their question to three other students before they ask you. Online activities can help prepare students to be more active learners. A hypothetical, but similar, problem to that which will be addressed in lab can be opened for discussion among the lab participants via threaded discussion prior to class meeting.



**Suggestion** from a Geology instructor:

Encourage collaboration. The students will learn as much from hashing things out with one another as they will from you – if not more.

- **Pace student progress.** Time allotted for labs is frequently too short and students will not finish unless they are kept on track. Indicate which parts of the lab absolutely must be completed during the period. Periodically, you might announce what they should be working on. Try to keep the class at roughly the same point, but recognize that students work at different rates. Try to help groups that are lagging behind schedule. For those who finish early, encourage review of the material or discussion of additional questions. Also, expect some socializing. Early completers might be encouraged to work with slower groups.
- **Provide a sense of closure and clean up.** A good conclusion reinforces learning. It is a time for reflection and processing observations. Post results on the board and let the students draw their own conclusions, as part of a class discussion. If time is short, you can begin this when most people have finished. Follow-up and completion can be accomplished as an online activity using threaded discussion for reflection and exchange. Allow sufficient time for tidying up. Check that all equipment and utilities such as gas, air, and water outlets have been turned off. Again, effective communication with the lab manager will provide clear guidelines and expectations.

[Adapted with permission from *Guidebook for Teaching Labs for University of Michigan Teaching Assistants*: The Center for Research on Learning and Teaching and The LS&A TA Training and Development Program.]



**Resource** -- The Center for Teaching & Learning is a faculty support organization that can provide technical assistance as well as course design assistance. For more information on resources to aid you in designing, developing, and conducting all or part of a course online or with the enhancement of various digital media, **visit our website** or call 644-8004.

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