

Teaching at MSU: An Introductory Handbook for Graduate Assistants

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*The ATTIC—The Awareness of Teaching and Teaching Improvement Center
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What Is Effective Teaching?

Although many people believe that good teaching is impossible to define in any general way, a large body of research suggests that certain characteristics are consistently associated with good college teaching as viewed by students, teachers, and administrators. They are:

1. The teachers got right down to business. They began class promptly and were well organized.
2. They taught at an appropriately fast pace, but stopped regularly to check student comprehension and engagement.
3. They used a variety of instructional strategies rather than lecture alone.
4. They focused on the topic and their instructional objectives and did not get sidetracked.
5. Their explanations were clear.
6. They used humor that was in keeping with their individual styles.
7. They practiced good classroom management techniques, holding the attention and respect of the group.
8. They interacted with students by providing immediate answers to questions or comments and corrective feedback when needed. They praised student answers and used probing questions to extend the answers.
9. They provided a warm classroom climate by allowing students to speak freely and including personal humor or other attempts to relate to the students as people.
10. They used nonverbal behavior, such as gestures, walking around, and eye contact to reinforce their comments.

Research has also consistently identified knowledge of subject matter, organizational skills, enthusiasm, clarity, and interpersonal skills as marks of the effective teacher. Characteristics of good teaching are not mysterious or extremely relative. They have been identified by researchers, students, and professionals alike.

These characteristics fail to support the commonly held belief that good teachers are born, not made. While certain characteristics such as humor and interpersonal skills seem to come easily to some and not to others, people are not born with the knowledge of a given discipline or competency in the use of instructional strategies. Those who exhibit the qualities of effective teachers consistently say that they work very hard at their teaching and are very conscious of their actions and their effects. They say good teachers are made, not born.

Starting Well and Maintaining Growth in Teaching

After studying new faculty at different institutions over several years, Robert Boice (1991) identified several characteristics of teachers he calls "quick starters," those who adjust easily and make steady progress in their work. "Quick Starters":

1. Are concerned about students' active involvement in the learning process.
2. Avoid feelings of isolation by developing social and professional networks with colleagues.
3. Seek advice on teaching from colleagues and consultants.
4. Avoid being critical and negative about undergraduate students.
5. Learn to balance time across teaching, research, and service.
6. Are highly energetic, curious, and humorous.

Truly effective teachers feel the need to continue to grow and learn (Chism, 1993) and avoid burnout by:

1. Stimulating their thinking by taking advantage of opportunities to learn of new approaches to teaching through attending workshops, observing colleagues, and joining book groups or seminars on teaching topics.
2. Relying on colleagues or teaching consultants to provide them support as they experiment with teaching or to challenge them to try new things.
3. Obtaining regular, systematic feedback on their teaching.
4. Reflecting on their teaching continually and making changes based on those reflections.

Teaching is, as a report from the Higher Education Research Program in 1989 stated, "the business of the business," the main purpose for institutions of higher education. Instructors who take this responsibility seriously strive continually to be more reflective about their practice and to improve as their careers progress. Good teaching involves more than the simple transmission of information and includes motivating students and creating a positive classroom environment as well. When coupled with the many other responsibilities a university instructor has, however, efforts to teach can lead to stress and burnout. Maintaining realistic expectations and exercising time management are ways in which instructors can help to avoid unproductive stress.

Useful Sources on Effective Teaching

Boice, R. "A Quick Starters: New Faculty Who Succeed." In M. Thrall and J. Franklin, eds. *Effective Practices for Improving Teaching*. (New Directions for Teaching and Learning, No. 48.) San Francisco: Jossey-Bass, 1991, 111-21.

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O'Neil, C, and A. Wright. *Recording Teaching Accomplishment*. 4th ed. Halifax, Nova Scotia: Dalhousie University, 1993.

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Getting Started: Your First Teaching Experience

As you thought about what your very first day in front of a class of undergraduates might be like, did you imagine all sorts of terrible things happening? Did you imagine going through a long set of equations only to realize just before the end of class that you're not going to get the answer you want? Or do you imagine your students asking you questions, catching totally unaware, and then your fumbling for a response? Even if that first day of class does go well, few T.A.s come away without having experienced a rapid pulse, sweaty palms, and a dry mouth.

Although there is no way to guarantee your composure on that first day, the greatest insurance is to have an idea of what to expect and abundant amount of material ready to use. But don't simply rely on memories of your own undergraduate days to give you an idea of what awaits you. Instead, the semester before (if at all possible), try to observe at least one class like the one you will have, and talk to the instructor to find out about problems and successes. Or you may want to find experienced faculty in your department and pump them for information and tips.

Many new T.A.s prepare too much material for their first day of class, but if you don't yet have a feel for how much time a topic requires, your confidence will be better served by having too much material rather than too little. For flexibility, in your notes you can divide your topics into basic and optional material. It also helps to make note of what time you move on to the next basic topic. Be sure to leave some time for questions from the students, but don't depend on the students to fill up the time since they may be quite new to the subject matter.

There are several conventional topics with which to open a course. First, you can explain what you hope to accomplish in the course and why you find the subject matter important. In this regard, you should probably outline what subjects you will treat and perhaps also say how your course connects with others in the discipline. Second, you can hand out your syllabus and go over it with the class. In discussing the syllabus and course organization, you should explain how the lectures and sections or labs--if these are part of the course--fit together. Be prepared with chalk and enough syllabi for everyone; be ready to answer questions on grading and exams and to recommend alternatives if the students tell you the readings aren't available from the bookstore yet. The syllabus will give you and the students something to concentrate on other than your shaky knees, and it will show them that you are organized, have planned ahead, and think that this course is important enough to warrant a good deal of your time and effort.

You can also tell your students something about yourself that first day. If the class is small, you can have class members introduce themselves. Another way to handle introductions is to divide the students into pairs and give each person five minutes to interview the other member of the pair. The pairs then introduce each other to the rest of the group. This method has the advantage of not putting people on the spot to talk about themselves, and it makes sure that everyone already knows at least one other member of the group well. In any case, try to learn your students' names as soon as possible; it is a great help both personally and pedagogically. Some teachers pass out 3 x 5 cards and ask students to write down their names, addresses, e-mail addresses, and a couple of sentences telling why they are taking this course. If the class is large, you might consider using a seating chart for the first week or two. This way, not only will you learn students' names, but they will also learn one another's. One professor takes Polaroid

photographs at the end of the first class and has the students sign them. He then uses odd moments, on trains or at meals to shuffle through the cards until the names and faces are all familiar.

Although many teachers devote the first day merely to such preliminaries, others recommend that you make a running start—that is, that you also begin discussing material or presenting information. This signals the students that you are serious about making their time with you worthwhile and that you expect progress to be made in every session together. Since students are also “shopping around” for the best courses at the beginning of the semester, you will give them a fairer sense of your course by actually getting into the subject matter and letting them sample your approach.

In general, remember this: you know more than you think, and your students will cooperate if given a chance. If you let them know what you want to do, and if it sounds at all reasonable, they will help. They will be especially patient if you feel comfortable telling them that this is your first experience teaching and you would appreciate their cooperation.

Six Tip for Handling Nervousness

Practice

Although practice may not make perfect, doing a presentation out loud several times before the real thing will make you feel more confident, especially if you practice under conditions as close to the actual situation as possible. Make yourself do at least one dry run in front of an audience, even if it's just a friend or spouse.

Concentrate on the Ideas

Concentrate on the ideas you want to get across, not on your own nervousness. Even timid people speak up when it's something they care about. Think about your audience's needs, not your own.

Make a Strong Start

You'll be most nervous at the beginning of the talk, so start with an introduction that will be easy to remember and that will relax you as well as the audience.

Visualize

Rehearse for your first presentation by actually visualizing how it will go. Imagine what you'd like to say, how you'd like to say it, and a positive response from the audience. Many athletes use a similar approach by imagining an entire dive or jump, in detail, before they actually do it.

Use Audiovisual Aids or Multimedia

Particularly if you have lots of technical information to cover, it can be reassuring to have much of it already written on transparencies or slides. Even just an outline on the board can reassure you that you won't forget what you want to say. If you are already very comfortable with computers and technology, you can use multimedia (such as PowerPoint) to prepare your materials beforehand.

Assume a Confident Attitude

To a large extent, you can control your own reaction to sweaty palms or a pounding heart. Tell yourself that you're "psyched," not nervous. Remember that to an audience nervousness can seem like dynamism or energy. Your attitude will probably determine what the audience thinks.

The First Day of Class

Even as an experienced T.A., you may find that you get anxious about meeting a new class for the first time. There is a reason for this. Classes vary enormously in their character, and techniques that you found succeeded beautifully with one group of students may not with another. Even if a class turns out to present no special problems, you will want to establish rapport, or at least a good working relationship, with it. There is also little doubt that a poor first session with a class can be difficult to recover from. You may find it harder to arouse the students' interest the next time, and they may have already begun to consider another class.

To prevent problems, you will want to prepare as carefully for this first session as possible. Decide whether you will be content covering some preliminaries or whether you will make the "running start" that was discussed above. Leave some time for questions from the students, but don't depend on the students to fill up the time. Above all, seem organized and prepared.

Here are two other time-tested suggestions. First, begin by connecting your new material with something the students are more familiar with—their prior experience in another class or elsewhere. This will lessen the anxiety about embarking on new material and increase their interest in a subject whose significance may not yet be clear to them. Second, point out assumptions the students may have derived from their previous experiences and then "violate" one of the assumptions. For example, ask about the events following dropping the bomb on Hiroshima. Then ask them what might have happened if the bomb had never been dropped. Such a technique piques students' interest and draws them into the subjects to be covered in the course.

Techniques like these and others you may discover as you talk with your colleagues should help the semester begin successfully. Remember, however, that even if the first session goes poorly, your future with the class may be more difficult but far from impossible. Students are amazingly forgiving as long as they can see effort being expended on your part. You will also find them willing to make suggestions on how you could change things for the better if you decide this is necessary. You can ask them for their ideas directly or take advantage of a mid-semester review of teaching evaluation, if your school or college offers it.

Motivating Students and Creating a Good Classroom Environment

Effective teachers realize that teaching is more than simply "laying out the feast of knowledge" and hoping that students will be motivated enough to partake. Teachers can have significant impact on levels of student motivation through exciting interest and encouraging learning as well as in introducing information. Instructors who excel in inspiring students argue that creating a good classroom environment is fundamental to their success. Here are nine tips for improving your classroom climate:

1. Make students feel important. Instructors who value students avoid condescension, sarcasm, and impersonal behavior and cultivate self-esteem through praising good performance and taking a personal interest in students.
2. Make students feel invited. In a number of studies of student retention, the presence or absence of a close relationship with an instructor is cited as an influential factor on retention. Instructors who make students feel invited, both in class and outside of class, have a strong impact on motivation.
3. Deal with needed changes from a positive point of view. Honest and frequent feedback is essential to good learning, but even very critical feedback can be offered in a constructive way. Instructors can usually find some good point to praise and can suggest specific ways in which unsatisfactory performance can be improved.
4. Learn to make nonverbal cues. Good eye contact, smiles, and active listening skills such as nodding, help to motivate students.
5. Get to know students personally. Research cites instructors who request that all students visit them personally outside of class to chat informally and instructors who have lunch or coffee with students as examples of those who understand that a personal acquaintance enhances the teaching-learning relationship.
6. Learn to empathize. Instructors who remember some of the hardships, uncertainties, and stress of their own student days are better able to help their students who are undergoing those difficulties.
7. Establish parameters. Instructors who clearly define tasks and set high expectations for behavior and learning are better able to motivate students.
8. Use student-centered instruction. Student-centered instruction involves planning learning activities that will actively engage students and anticipate the kinds of opportunities and challenges that will be present in a specific area.
9. Be enthusiastic. Most instructors find their discipline compelling, but sometimes it is hard to recapture excitement about a familiar topic. Trying to look at the familiar in a new light or to present things in fresh ways are strategies instructors use to maintain their enthusiasm. It is said that enthusiasm shows—so does its absence.

Integral to any discussion of motivation is "personalizing" the classroom. Using instructional strategies that enable some individualization of instruction or small group work helps to develop personal investment and interest in learning. Similarly, direct attempts of instructors to talk about such things as their own life experiences related to the subject and their personal difficulties in mastering certain concepts create a warmer classroom climate.

Effective instruction, then, entails paying attention to the "people" dimensions of the learning situation. Instructors who make some effort to get to know their students and to establish a good relationship with them will find that the efforts are well rewarded in the quality of learning that results.

The Syllabus

The Importance of the Syllabus

Having a well-developed syllabus will require you to organize early and to think precisely about teaching, both of which are essential for a successful class. It will help students to know what is expected from the start of the course and will allow them to plan their semester more efficiently. The opportunity for capricious grading changes will be diminished and a positive image will be presented to the students (a well-prepared syllabus is evidence that you take teaching seriously). A syllabus also provides your department office, supervisor, and/or colleagues with pertinent information about the course. Most departments require some sort of syllabus.

A large number of misconduct and student complaints have at their root a lack of understanding of the requirements and expectations for performance in a course. A syllabus can consolidate into a single document all the routine matters that surround teaching a course—reading schedules, grading, due dates, class topics, etc.—that would otherwise have to be communicated in individual conversations with each member of the class.

Simply put, the syllabus is a formal statement of what the course is about, what students will be asked to do, and how their performance will be evaluated. Unlike the comments an instructor makes in class, it is a lasting statement to which students can refer again and again. Careful construction of the syllabus reduces ambiguity and is the first step toward producing an environment in which students and you can flourish.

Preparing an Effective Course Syllabus

One can begin by studying syllabi from other instructors or those that have been used previously in the course being taught. You might also check with your department for any specific guidelines it may have about a syllabus format. The following information is generally included in a syllabus:

1. Relevant information about the course and instructor—The information should include the current semester and year, the name and number of the course, the meeting time (with days of the week), and location. It should also include your name, phone number, e-mail address, location of your office, and your office hours. This information is normally placed at the beginning of the document.
2. A clear statement of course objectives—The course objectives should be as clear as possible and should describe what the students will be expected to know—and at what level of competency—at the end of the semester, rather than what you plan to do.
3. A description of the means (or activities) for approaching the course objectives—Possible items include field trips, guest lecturers, discussions with active participation, problem-solving groups, assignments, use of audiovisual materials, etc. The amount of student time required for each activity might be estimated.
4. A list of resources to be obtained by the students—Most important here are the required text(s) and reading assignments. (It might be a good idea to double check that the Bookstore

has the texts on the shelves before the students are sent off to buy them.) Any supplemental materials such as, lecture tapes, sample projects, or past tests that are available can appropriately be mentioned.

5. A statement of grading criteria—This will explain the grading criteria, the components of the final grade, the weighting of various grades, the relationship of class participation and attendance to the final grade, and other relevant information. The number of tests each semester might be included, along with a description of each test.
6. A statement of course policy—This is best expressed in a clear, non-threatening form. Policies should be set forth for such things as missing an exam, turning in a late assignment, missing class, requesting an extension, incompletes, and reporting illness. It is a good idea to go on record with a fairly stringent policy that can be informally tempered at a later date, if and where circumstances so warrant. Absolutes are always more trouble than they're worth. There can also be a short statement defining academic misconduct.
7. A schedule—If each class hour is mapped out in detail, this section will doubtless be the longest and most time-consuming of the syllabus to prepare, although it will be a good investment in a well-organized class. The syllabus should, at a minimum, contain dates with the corresponding sequence of lectures or lab topics, the preparations that are required or suggested, and the assignments that will be due. Note holidays and the date and time of any midterms, as well as the final exam.

The Syllabus Has a Personality

Beyond the content of the syllabus is its tone, which can give welcoming or hostile messages. A brief syllabus with strong warnings about policy infringements and no encouraging words about the excitement of the course content may be off putting. Syllabi that contain humor and enthusiasm can create a good first impression. For example, one professor claims that his course is the most exciting calculus course on this or any planet. Another professor at the University of North Dakota (Harris, 1993) posits ten rules for syllabus construction that take motivation, as well as clarity into consideration. They include:

1. Convey enthusiasm for the subject.
2. Convey the intellectual challenge of the course.
3. Provide opportunities for students to personalize the content.
4. Convey respect for the ability of students.
5. State course goals positively so that they appear attainable.
6. Convey the possibility of success in stating grading policy.
7. Adequately specify assignments.
8. Vary assignments according to the type of expertise required.
9. Make provisions for frequent assessment of student learning.
10. Convey the teacher's desire to help students individually.

Similarly, spatial layout can make a difference. Syllabi that are well designed will certainly be more effective than those that are cramped or typed on poor quality machine. Thanks to desktop publishing, laser printers, and the availability of many typefaces and styles on most computers, syllabi can have a professional look to them.

Using the Syllabus in Class

It is important to check over the final copy of your syllabus for mistakes and typos. If you do not spot them, it is certain that your students will. It is a good policy to hand out the syllabus on the first day of class. That lets the students know that you are well prepared, and it provides an easy way to begin the interaction with students and to reduce some of the uncertainty and anxiety often associated with the first class meeting.

You will need to review and discuss the syllabus with the students, answering any questions that they may have and providing appropriate amplification where necessary. You will probably find that most student feedback will be generated on the section on grading.

It is vital to have enough copies of the syllabus, and you should allow for the need to replace lost copies and to accommodate students who have registered for the class but whose names do not appear on your class list.

If changes are made in the syllabus subsequently, it is a good idea to give them to students in writing. Much ambiguity and confusion can result from half-remembered spoken promises.

Putting Course Objectives into Practice in Imaginative Ways

Once course objectives have been set, the next task is to put them into practice. Much of this section has assumed the use of traditional classroom formats such as the lecture/discussion mix or lectures coupled with laboratory demonstrations. There are, nonetheless, a variety of other possible methods for the delivery of instruction. These are discussed in this handbook in the sections on lecturing and active learning. In selecting and planning classroom instructional strategies to match course objectives, it is important to consider the following:

1. Will the strategy accomplish the objective? It is unlikely, for example, that straight lecturing in a course designed to increase problem-solving skills would be an appropriate strategy for all class sessions. Group work would be a poor choice if rapid transfer of information is the goal.
2. Will the strategy be accessible to all students? If only hands-on work is used, those who learn best by listening, reading, or writing will be at a disadvantage. It is best to establish a rhythm of strategies so students can experience learning through a variety of methods.
3. Will the strategy be feasible, given the context? Is the classroom structured to preclude certain activities? Is the class too large or too small for certain activities? Are the class periods long enough to accommodate the use of certain activities?
4. Will students need preparation to respond to the strategy? Since students are so used to being passive in class, you cannot automatically assume that they will be able or want to respond to group work, independent work, or other activities. It is often important to build in some time for helping students to get the most from a given instructional approach before it is used.

5. Are you comfortable with the approach? Often, even when a given approach seems most appropriate, an instructor will not be at ease with it. Although you should continually try to expand your repertoire, it is important to choose strategies that are within your personal comfort range.

T.A.s using these important alternative methods need to be clear about specifying the learning task and breaking it up into manageable units if it is complex. Students will need monitoring through the exercise, and an external resource person who can offer students help should always be available. It is a good idea to test new material on a sample group so that it can be revised before it reaches your intended audience. Finally, it is vital to ensure that easy access is available to all the materials and that sufficient opportunities for student feedback are built into the course design.

Begin with the instructional objectives. Select alternative methods to the standard lecture and discussion format only if they will help students to attain more easily the goals set for the course.

Useful Sources on Course Design

Altman, H., and W. Cashin. *Writing a Syllabus*. (Idea Paper No. 27) Manhattan: Kansas State University, Center for Faculty Evaluation and Development, 1992.

Andrews, J. *Teaching Assistance: A Handbook of Teaching Ideas*. San Diego: University of California-San Diego, T.A. Development Program, 1982.

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Lecturing

The survival of the basic lecture—a method of teaching by discourse rather than conversation or seminar—in this age of technology and electronic media is, in many ways, remarkable. Lecturing is probably the oldest teaching method and remains the most common form of instruction in United States colleges and universities, despite the fact that some research has shown that lecturing is ineffectual, especially if not combined with some alternative style of teaching. While working to improve skills at lecturing, you might also determine if the lecture approach is the best method of teaching for the achievement of your goals for the class. Lecturing is very appropriate for some goals and very inappropriate for others.

Strengths and Weaknesses of the Lecture Approach

Strengths of the Lecture Approach

1. Lectures can communicate the intrinsic interest of the subject matter. The speaker can convey personal enthusiasm in a way that no book or other media can. Enthusiasm stimulates interest, and interested, stimulated people tend to learn more.
2. Lectures in university settings can provide students with role models of scholars in action. The instructor's way of approaching knowledge can be demonstrated for students to emulate.
3. Lectures can convey material otherwise unavailable, including original research or recent developments that have not yet made it to publication.
4. Lectures can organize material in a special way. They may be a faster, simpler method of presenting information to an audience with its own special needs. Lectures are particularly useful for students who read poorly or who are unable to organize print material.
5. Lectures can convey large amounts of factual material.
6. Lecturers can speak to many listeners at the same time.
7. Lectures permit maximum teacher control. The instructor chooses what material to cover, whether to answer questions, and other courses of action.
8. Lectures present minimum threat to students. They are not required to do anything (which some students may prefer).
9. Lectures emphasize learning by listening, an advantage for students who learn well this way.
10. As Eble (1976) notes, lecturing beats textbooks or video in that it offers face-to-face confrontations with other talking, gesturing, thinking, feeling humans.

Weakness of the Lecture Approach

1. The lecture puts students in a passive rather than in an active role. Passivity can hinder learning.
2. Lectures lack feedback to both the instructor and the student about the students' learning. They encourage one-way communication.
3. Lectures require an effective speaker who can vary tone, pitch, and pace of delivery. Lecturers must be verbally fluent, a skill that is in general, distributed unevenly among people.
4. Lectures place the burden of organizing and synthesizing content solely on the lecturer. They are not well suited to higher levels of learning such as application, analysis, and synthesis.

5. Lectures are not well suited to complex, detailed, or abstract material.
6. Lectures assume that all students do not sustain attention, which wanes very quickly in 15 to 25 minutes.
7. Lectures tend to be forgotten quickly

Planning Lectures

How to Plan an Effective Lecture

Instructors might remember that the learners' minds are not blank slates, and the organization of the lecture must take into account the students' existing knowledge and expectations as well as the structure of the subject matter. Fink (1989) points out that the most intellectually alive and exciting lecturers tend to be those who view knowledge as a dynamic process rather than a static product.

You may want to think about this model as a way of approaching the preparation of a lecture. Think about it as a progression of steps in which you answer a variety of questions along the way:

1. Select a topic. Your first decision should be on the overall subject matter of the lecture. This will probably be drawn from whatever is on the syllabus for that day's class.
2. Decide on the purpose. Once the topic is chosen, the next stage is to decide WHY it is being taught (this is not as obvious as it may at first appear). Possible questions might be: Is my aim to make students understand this difficult concept? What are the key facts I want my students remember? Do I want to advocate a particular idea or behavior? Is one of my purposes to entertain? Is preparation for an examination the main point of the lecture?
3. Analyze the class. Just as performers need to know their audience, so lecturers need to analyze their class. It is useful to determine: what is the level of students in this class? How mature are they as learners? What is their prior relationship (if any) with this subject matter? By exploring the population of the class, it may also be possible to predict what learning styles will be preferred by this group of students.
4. Analyze the occasion. In addition to studying the composition of the class, it is also helpful to analyze the occasion before preparing each lecture. A class early in the morning, for example, might require a lecturer to be more extroverted, in order to wake the students up. Long class periods may be especially suited to an interactive lecture. Students at the beginning of the semester may be more enthusiastic than during the last week of classes. These issues can be predicted in advance, and such an awareness will usually improve the effectiveness of the lecture.
5. Gather materials. After all this analysis, the next step is to gather the materials to be used in the preparation of the lecture. It's a good idea to bring everything together before sitting down to write, so that you have all the necessary sources immediately at hand.
6. Prepare the lecture. After all the materials are together, the next step is to compose the lecture itself. Some discussion of what form of lecture notes is most appropriate follows, but it is certainly desirable for lecturers to have done sufficiently detailed preparation to be entirely comfortable with the content of the lecture.

7. Practice the lecture. Finally, it is a good idea to practice your lecture, whether to a living audience or into a cassette tape or audiotape, especially if you are inexperienced. This will help your phrasing and delivery and will perhaps provide some advance feedback.

The Introduction

You might want to think about planning an introduction that points to a gap in the students' knowledge or challenge or raise a question about something in the students' minds in order to arouse curiosity. Good introductions also may help students to discriminate between more or less important features of the lecture, may help them create realistic expectations about what they are supposed to learn from the lecture, and enable them to allocate their information-processing capability much more effectively. In short, the aim is to capture the interest of the listeners. As with a good drama, effective lectures hook their listeners' attention from the start.

Suggestion: Raising a question to be answered by the end of the hour.

Example: By the end of the hour, you should be able to answer the question "Are lectures better than discussions?"

Suggestion: Explaining the relationship of the lecture content to professional career interests, the real world, etc.

Example: Today's lecture is about the cost of living indices, a topic in macroeconomics that should help you understand the recent discussions in Congress related to inflation.

Suggestion: Relating the lecture content to previous class material.

Example: For the past week we've been occupied with the history of the live theater. Today, we'll be looking at film history, and we'll spend the rest of the week comparing the two forms.

Suggestion: Telling students how they are expected to use the lecture material.

Example: Today, I'll offer a specific model of evaluation and illustrate its applicability in several different kinds of settings. When you meet in your discussion groups later this week, you'll be asked to apply the model as you discuss the Brown vs. Board of Education decision.

Some other ways to start a lecture include:

1. Telling a personal anecdote or telling a relevant funny story or joke.
2. Providing an overview of the lecture.
3. Giving the lecture an intriguing title.

The Body of the Lecture

In the body, instructors can allow for some flexibility in the amount of content to be presented in order to respond to students' questions and comments. It is imperative to determine the key points to be developed during the class session, and not to present nuances and minute detail to the extent that students lose sight of the main idea. Instructors should not feel pressed to cover

everything, since an effective lecture uses a varied pacing to help students make some critical discriminations between important concepts and trivia. Many researchers suggest that the individual lecture should cover only four or five main points that are made explicit to the students. The body of the lecture must, of course, be well organized. Organizing the lecture can be done in a number of different ways. The most appropriate will depend on the subject itself as well as the lecturer's personal approach. Here are some examples:

Cause and effect: Events are cited and explained by reference to their origins.

Example: One can demonstrate how the continual revolutionary movements of the late 1700s affected British politics at the turn of the century.

Time sequential: Lecture ideas are arranged chronologically.

Example: If lecturing about the steps in a clinical supervision model, talk about the initial step to be taken, the second step, and so forth.

Using an organizational idea to structure the lecture.

Example: Today we will view all these methods from a perspective of validity.

There are many other organizational possibilities. You might state a problem and then offer alternative solutions; arrange your lecture topics according to their importance, familiarity, or complexity; or offer a two-sided comparison and contrast presentation.

It is very important to include examples in your lecture. Almost all writers agree that illustrations help people to understand things.

Another strategy that lecturers often use is to provide a break in the information output every ten minutes or so in order to maintain attention. These are good times for anecdotes, visuals, humor, questions, etc.

The body of the lecture can help the students understand the way in which the points are organized. After stating major points verbally, it is a good idea to put them on a handout or write them on the board or an overhead projector. Complex points are easier to explain if the instructor:

1. Uses an appropriate vocabulary level.
2. Uses a variety of illustrations.
3. Includes essential content before nice to know content.
4. Restates points after illustrations. Illustrations or examples will work best if they include some of the following qualities:
 - Precision (fit the idea well)
 - Relevance (fit the context well)
 - Ingenuity
 - Interest

- Novelty
- Humor
- Scholarship

The Conclusion of the Lecture

McKeachie (1997) says that in the conclusion of the lecture one has the opportunity to make up for any lapses in the body of the lecture. He also notes that encouraging the students to formulate questions by asking questions oneself can facilitate memory and understanding. The prospect of unanswered questions to be treated in future lectures creates anticipation of the future. Other possibilities include:

1. Restating the main points (without cueing that it is a summary) by using a new example, asking for the main points, and showing where the class is now.
2. Asking a student to summarize the lecture's key ideas.
3. Restating what students are expected to have gained from the lectures.

Instructors can stimulate discussion and increase interaction after presenting a lecture or large amount of content by pairing students and giving them two or three minutes to react, respond, and raise questions or issues about the material just presented. Students then report out what issues and questions were raised in their discussions.

A final point: Lecturers should not let their students tyrannize them (through packing bags, talking, or moving around) into cutting the lecture short. Herr (1984) suggests that instructors make a remark designed to refocus student attention: (With a smile) You have four more minutes for which you have paid, and I promise to end promptly, so just wait to grab your back packs. Another trick for the end of class is the creation of suspense, which can be accomplished in a variety of ways such as posing a question. One should make sure that there is no consistent verbal or nonverbal cue signaling the end of class, which will cause students to lose attention. Such a cue might be the return to the podium, gathering of papers, . . . or a variety of other gestures or phrases.

Lecture Notes: Selecting an Appropriate Format

There is no easy answer to the question of what kind of lecture notes work best; it depends on the individual. Research has been done on the cognitive consequences of different kinds of note taking that may be helpful to the new lecturer. Lecture notes vary widely as to the amount of information they directly display, the extent to which they rely on overt organizing structures, and their general formats. As they become more experienced, many lecturers find that they become progressively less reliant on notes.

Verbatim Notes—One option is a complete verbatim script of every line of the lecture, from complex points to the closing words, have a great weekend. One of the drawbacks of this approach is that the lecturer is encouraged to use language more appropriate to the eye than for the ear—long and syntactically complex sentences, for example. There is also an obvious danger that lecturers will simply read the words without regard for the thoughts expressed. Lecturers may find themselves launching into inappropriate intonations. If the instructor is disengaged and remote from the material, then the same thing is likely to happen to the students. This format

takes a great deal of preparation time; it also discourages students from asking questions and making comments during the class, since the instructor seems more interested in the notes than in taking questions. It is also easy to find oneself reading from the wrong page by mistake! (It has happened!) One advantage of this approach, however, is that lecturers decrease the number and complexity of things they need to think about while teaching. This may be particularly important for beginning teachers.

Outlining—One widely used format for lecture notes is the outline. This is the style of notes recommended most often by expert lecturers. Outlines have many advantages. If one is used, the instructor will need to form new sentences in class since the notes will merely express thoughts in simple phrases. The result is likely to be language devised for the ear rather than the eye. The lecturer is also more likely to speak with appropriate intonation. By seeing what is ahead at a glance, it is easier to work out what to omit if time is short and to judge which points can be embellished if it is long. Lecturers using outlines need not be as tied to a podium. There are disadvantages, though. If the instructor is not very fluent in front of an audience, um's and er's make result, along with a lot of fumbling. There is also an increased danger of not making the points of connection clear to the students.

Some lecturers simply jot down the major points in the order they want to discuss them. The advantages are similar to the outline approach, but there is the danger of forgetting why a specific phrase or example was included. This method necessitates a very firm grasp of the material. It is most appropriate if used as a memory aid to recall a detailed set of notes that perhaps used to exist.

Nonlinguistic Formats—An alternative to linguistic formats is the use of "tree" diagrams, computer flowcharts, and the like. Another choice is a pictorial format, which includes all nonlinguistic symbols to be found in lecture notes. Some points work wonderfully well as pictures; others are extremely difficult to represent in a nonlinguistic form. Nonlinguistic formats carry disadvantages and potential problems as the other non-verbatim forms of notes already discussed.

A final possibility is a mix of all these options that reflects the special strengths and weaknesses of the individual teacher.

Some Final Comments

Instructors are advised to assess what needs they want their lectures to fill, and whether they prefer to work with linguistic or nonlinguistic notations—what one instructor finds easy to use, another may find impossible.

Once the format is chosen, the instructor may wish to examine these other possibilities to determine if they can be combined to produce a more useful and appropriate format. Typically, a lecturer teaching for the first time will use comprehensive notes that progressively become briefer as the instructor becomes more familiar with the material and gains confidence. For many new teachers, the first day of lecturing is less traumatic if the lecture is clearly mapped out on paper beforehand.

Presenting Lectures

Most people agree that a lecture with excellent content can be easily ruined by poor presentation. It is crucial to grab the attention of the students and to retain it throughout the class. For many students, memorable lectures are those presented by instructors with a flair for a vivid, exciting style of presentation. However well structured and carefully prepared a given lecture may be, the importance of the way it is actually delivered cannot be overemphasized. A lecture, after all, is a classroom presentation rather than a formal speech.

Improving Presentation Techniques

1. It is advisable to vary speech rate, volume, and pitch. Important ideas can be cued by slowing down and leaving pauses. Students usually take notes at less than one-fifth the rate at which most lecturers speak.
2. Good lecturers speak to the students and not to the chalkboard, walls, notes, floor, clock, etc.
3. It is important to enunciate clearly and to speak loud enough to be heard. In the very first class, instructors might suggest that people—especially those at the back—signal if they cannot hear.
4. Instructors can feel free to let their sense of humor show. However, jokes at the expense of the students or jokes that offend the reasonable sensibilities of the group should be avoided. It is easy to offend unintentionally.
5. Repetition of pet words or phrases (such as uh, okay, you know what I mean?, all right) must be avoided.
6. Establishing and maintaining eye contact with students usually is important for good communication.
7. It is appropriate to use gestures and physical movements that complement verbal statements and teaching style (e.g., looking at students while asking for student questions).
8. Distracting gestures or physical movements (e.g., grooming, pacing, straightening tie or notes, playing with beard, etc.) are best avoided.
9. Enthusiasm is important. If the teacher does not think the material is worth learning, why should the students?
10. The lecture room may need adjusting for physical comfort (close doors, clean board, open or close the windows, adjust the temperature if possible, etc.)
11. Effective teachers often cultivate an informal classroom atmosphere. They try to build a rapport with students during the lecture so students feel drawn in, close to the speaker, and, consequently, ready to listen. One suggestion is to come down from the lofty podium, lean against the wall, or pull up a chair and join the class.
12. It helps to practice in front of a mirror before delivering the lecture.

Soliciting and Responding to Student Feedback

Here are some suggestions:

1. Looking at one's listeners provides all kinds of information. Most people give off a multitude of nonverbal clues (such as rustling or facial expressions) about whether they are paying attention, whether they understand, and whether they agree.

2. It is crucial to solicit questions. Even if all the instructor does is pause, look around, and ask if there are any questions, he or she will have significantly added to the effectiveness of the lecture. An instructor may check for student understanding by asking general questions such as "Do you have any questions?" but a more effective strategy is to ask more focused questions of an individual or small group. Another strategy is to ask students periodically to summarize a major point of the lecture in their own words or to identify one or more main ideas of the lecture. These techniques not only increase interaction during the lecture, but also allow students to assume more responsibility for learning.
3. Discussion techniques can be used. There are many ways of involving students, even in huge groups. Instructors can use show of hands or hand out different colored index cards that show different responses. It often works to call on a student with the correct response and have him or her explain.
4. Praise is an important tool in classroom give-and-take with students. Making positive comments when warranted has been shown to increase student learning.

Using Instructional Media in Lectures

Instructional media, often referred to as audiovisual aids, can be an effective means of enhancing lectures. Some examples of instructional media include the handy chalkboard, flip charts, magnetic or velcro boards, models, printed diagrams or illustrations, audiotapes, transparencies on overhead projectors, computer software, videotapes, 16mm films, and slides. Such media are most beneficial when they are a natural consequence of the teacher's objectives—the objectives should determine the choice of media and not vice versa. Although instructional media may seem to be a fun way to improve every lecture, they are only as good as the thought and preparation that preceded their use. And good instructional media, like good lectures, are notorious for the amount of initial preparation time they chew up. Once instructional media has been developed, however, they can be used over and over again.

Instructional media used effectively can help to emphasize important concepts within the lecture and can stimulate student interest and prevent boredom. Davis and Alexander (1977) found that instructional media can create an emotional response among students and generally motivate them to learn.

Using the Chalkboard

The chalkboard is surely the most widely used example of instructional media—nearly all classrooms have one. Here are some tips:

1. Bring your own chalk and carry some spares. Colored chalk can be useful to highlight important points of the lesson.
2. When planning the lesson, instructors might include a board plan that determines which points of the lecture will be illustrated on the board. They may also map out plans for the board before class.
3. It sounds so elementary, but good teachers write neatly and horizontally, making sure their handwriting is large enough for all students to read. Scrawling or incomprehensible abbreviations don't do you or the students any good.

4. Give the students time to write down what you have written on the board—don't erase your points too quickly.
5. Use the board only for essential information.
6. Perhaps the most important point is to talk to the students, not to the blackboard.

Using Overhead Projectors

The overhead projector uses plastic transparencies. It is a versatile tool that can be used in normal room lighting, and it allows lecturers to face the class. One caveat: student learning will not necessarily improve simply by using an overhead projector. Here are some helpful hints:

1. Transparencies work best if prepared in advance and placed on the projector during class time. They tend to be much less effective if instructors write on them as they go, and there is the danger that the overhead will become merely a prop for the teacher who is nervous of interaction. One exception is when overheads are used as an interesting way of recording a variety of student responses to an open question—this allows the instructor to group arguments and opinions visually as a way of better focusing the class.
2. Limit the amount of information presented on a transparency, which should be easy to read. Outlines of important points also help student learning if they are in different colors.
3. Students can be given blank transparencies—either in class or to take home—that can be used for formulating assignments for in-class presentation.
4. Turn the projector off when you're not directly referring to a transparency. Many instructors use a piece of blank paper to cover part of the transparency so that only the point being developed is revealed. Try not to leave one transparency on so long that it becomes boring.

Using Video in the Classroom

Video lends itself to the classroom extremely well, not least because it can build a bridge between the abstract world of academia and the real world around us. For example, in an English class, a T.A. might show a videotaped production of a Shakespearean play. A political science class might use a tape of a politician who visited campus or whose remarks were broadcast on C-Span. A chemistry class might be shown a videotape of an important but dangerous and expensive experiment. In a communications class, the students themselves could be taped during a problem-solving session so that later they can analyze the group process that occurred. Although the whole area of video-based instruction is highly complex, here are a few tips that may help you introduce video to your classroom.

1. Television, both broadcast and cable, is a great source of material. News, foreign affairs, and entertainment can be used in the classroom.
2. Students are used to watching television as entertainment, so they may need help in developing "critical viewing." You might consider stopping and starting the video to discuss important moments while they are still fresh in the students' minds.
3. You may want to think about providing an outline of the video's main points on an overhead projector, the blackboard, or handout so that students know what to be on the lookout for as they watch.
4. Check your media resource center for video holdings. If what you want is not there, the center may be able to acquire it for you.

Using Computer Software

Our IT department has support services for using technology in classrooms and computer labs. Regular workshops on learning computer software and operating equipment are posted on IT's web site.

General Suggestions for Using Media

1. Visual aids, no matter which ones you use, should augment your presentation; they are not meant to be the presentation.
2. It is important to be prepared to give the lecture without them. Equipment may arrive late or not at all. Something may go wrong or break down. Even the most careful planning cannot cover every possibility.
3. It is also important to preview all media to be used in class. Doing so will familiarize you with the content and structure and prevent any unfortunate—and sometimes embarrassing—mix-ups.
4. Visuals are best kept simple, with minimal wording. They should always be readable from a distance.
5. The students' line of vision ought not to be obstructed by podiums or you, for example.
6. Visuals should be put in the carousel projector or on the overhead when you are ready to use them. Take them off when you plan to talk about something else.
7. Effective teachers talk to the students, not to the visual aids.

Useful Sources on Lecturing and Media

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Laurillard, D. *Rethinking University Teaching: A Framework of the Effective Use of Educational Technology*. London: Routledge, 1993.

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Active Learning: Discussion Writing, and Performance

Traditional metaphors for learning that depict a student as an empty vessel or tabula rasa—a blank slate to be filled with knowledge—are reflected in classroom practices that call for the teacher to be active and the students to be passive. The lecture is the standard method of instruction in colleges and universities, reinforcing the notion of knowledge as a product to be passed on from a teacher to a student. These metaphors and practices continue to exert a strong influence on the ways in which we think of teaching and learning in our classrooms. Studies of classrooms show repeatedly that nearly 90% of time in college classrooms is filled with teacher talk.

Recently, however, new challenges to such traditional practices and ways of thinking about learning have been raised. National reports criticizing higher education have called for the use of instructional strategies that more actively engage students in learning and help them to acquire better skills in writing, speaking, thinking critically, and solving problems. Cognitive scientists are arguing for new concepts of learning, emphasizing that knowledge is not passed intact from a knower to a learner, but is actively constructed by learners who draw on their previous knowledge, mental processes, and experience to integrate new information into their knowledge base in ways that expand their knowledge and influence subsequent learning.

As Bonwell and Eison point out (1991), active learning has not been defined precisely, but some characteristics are commonly associated with the term:

1. Students are involved in more than listening.
2. Less emphasis is placed on transmitting information and more on developing students' skills.
3. Students are involved in higher-order thinking (analysis, synthesis, evaluation).
4. Students are engaged in activities (reading, discussion, writing).
5. Greater emphasis is placed on students' exploration of their own attitudes and values.

This section on Active Learning will present ways in which you can engage students actively through integrating various strategies into a lecture or using them as stand-alone methods. The main focus will be on speaking, writing, laboratory and clinical instruction, and other strategies for active engagement of students.

Leading Effective Discussions

A highly effective way to promote active engagement in learning is to provide opportunities for students to talk about what they are learning in class. Instructors are thus able to give the feedback that is such an important part of the learning process at the time when it is most needed.

Discussion techniques are one way to get students to verbalize what they are learning. Also, discussions can provide a social mechanism, examine and clarify any confusing concepts, and raise value questions. Discussions can be invaluable for any of the following goals of instruction:

1. To help students learn to think in ways that are appropriate to your discipline.

2. To help students learn to identify and evaluate the logic and evidence that form the basis of their own and others' positions.
3. To give students opportunities to formulate applications of principles.
4. To help students identify, formulate, and solve problems using information gained from readings, lectures, and life experiences.
5. To use the resources of members of the group.
6. To gain acceptance for information or theories counter to previous beliefs of students.
7. To develop motivation for further learning.
8. To get prompt feedback on how well objectives are being attained.

Setting Discussion Objectives

Well-defined objectives are an important prerequisite to a good discussion. They also help determine the kind of discussion appropriate for the situation. It helps to view discussions along a continuum from targeted discussions, where you carefully control the discussion and ask questions requiring specific responses, to open-ended discussions, where you allow the students to formulate the questions and control the discussion. If the objective is to assess students' comprehension of course material or review or summarize content, targeted discussions will be your best bet. If the objective is to promote critical thinking, curiosity about the topic, or tolerance for opposing viewpoints, open-ended discussions will serve you best.

A key difference between a targeted and open-ended discussion is the kind of question asked. Questions asked in a targeted discussion are often structured to produce short, convergent responses. Questions in an open-ended discussion provide more latitude for response. Here are some examples:

Targeted questions: What is the definition of an adjective? What are the stages of cell division?

Open-ended questions: What are some of the ways we might solve the crisis in the Middle East? Given the medical data before you, how would you go about diagnosing this patient's problem?

In targeted discussions, you will want to keep a fairly tight rein on the direction. In addition to using convergent questions, other ways in which you can focus the discussion include intervening after each response to comment upon it, summarize it, or redirect the question; mapping the direction of the discussion on the blackboard or overhead transparency; limiting the duration and number of responses; and moving quickly from one question to another. In an open-ended discussion, you want students to respond, encouraging a lateral rather than teacher-directed responses, e.g., "Does anyone have a comment on Mary's response?" or "Feel free to jump in and respond to each other"; and reducing your role as an authority by remaining quiet.

Although discussion questions should be tied to the purpose of the discussion, research also shows that questions that are middle-range in their openness elicit the highest quality of frequency of response. Andrews (1980) writes, "Perhaps the most important quality to grasp is a subtle blend of structure and freedom which give a discussion momentum and yet does not let it wander indiscriminately." In a study of questioning behaviors, he found that when instructors

used what he called "playground" questions, questions that designate the intellectual sphere for discussion and then give students latitude for answering, they got better results than when they asked very open-ended "brainstorming" questions, convergent "quiz show" questions, or highly unfocused "general invitation" questions such as "So what do you think of Plato?"

Building Rapport

Nothing is more important to a good discussion than good rapport between the instructor and students. Some of the behaviors that promote good rapport include:

1. Willingness to share personal experiences.
2. Willingness to admit uncertainties.
3. Openness to new ideas.
4. Ability to suspend one's judgment of others.
5. Ability to listen carefully to others' statements.
6. Tolerance of opposite points of view.

Many students test the waters to see how their ideas will be accepted; if the instructor lacks sensitivity, they may be unwilling to contribute.

The First Day of Class

Students look for clues to an instructor's temperament and orientation in a number of ways on the first day. Instructors who emphasize that discussion will be an important part of the course influence students' expectations. Some instructors go on to define the criteria for receiving full credit for class participation, including such things as integrating class experiences and materials, developing pertinent ideas, insights, or points of view, sharing pertinent experiences, asking relevant questions, and building upon points made by other members of the class.

Perhaps the most important ways to build rapport on the first day are more subtle. In order to set up a supportive environment right away, some instructors start the first day with activities designed to break the ice and get students used to speaking in front of a group. In smaller classes, they might ask students to share their names, hometowns, academic majors, and/or a question they would like the course to answer. Some instructors have students break up into pairs and share this information with each other. In larger courses instructors might ask the same questions, only using a show of hands, e.g., "How many of you are from New Jersey? How many from New England?" Instructors get their best results when they offer personal information about themselves to get the discussion rolling. They might, for example, talk about their personal or professional backgrounds or their first experience with the course the students are now taking.

You can promote an atmosphere of trust and rapport by offering some of the following questions and comments:

1. Can you think of a situation in which this notion might apply? Might not apply?

2. That's an interesting idea; tell me more.
3. I don't know either, but that's a very interesting question. Can anyone help us unravel ourselves here?
4. I'm not so sure I understand. Were you saying that the survey questions were too personal? Can you give me an example?
5. Feels to me as if we have kind of strayed from the point. Have we?
6. Let's not forget the basic problem we're trying to solve.
7. What's the first step?

Nonverbal cues

Nonverbal ways with which you can create rapport during a discussion are by:

1. Showing enthusiasm when listening to student responses by smiling expectantly and nodding as the student talks.
2. Keeping eye contact with the student who is talking.
3. Walking toward the person who is talking, even if there is only space to take a few steps in any direction.
4. Walking around the room throughout a discussion so that students will view people in different parts of the room.
5. Looking relaxed by leaning against the wall, sitting on a desk, or pulling up a desk or chair and joining the class.
6. Arranging students' chairs in a circle or some other configuration so that they can see each other talking.
7. Standing by students who have not contributed to the discussion. Proximity may draw them into the conversation.

Getting Discussions Started

There are many different techniques for leading discussions, from the most nondirective to the most programmed. Here are some suggestions for getting a discussion moving:

Start with a common experience. One of the best ways to start a discussion is to give a concrete common experience through the presentation of a demonstration, film, or role-playing.

Following such a presentation it is often easy to ask relatively open questions such as, "What are your immediate reactions?" or "Does anything in this film disturb you?"

Start with a question. The range of questions is listed in the section above on setting objectives. Questions that speak well to students' puzzles can be obtained by asking students to submit written questions in advance of the session. Once the first question has been asked and responded to, further questions come easily. The trick is to phrase the first question as well as possible. In general, you may want to try:

1. Using open questions to begin long discussions.

2. Waiting at least 10 seconds before rephrasing the question. Instructors rarely wait long enough for student responses.
3. Offering examples if the problem you posed appears to be too abstract.

Start with a controversy. One of the best ways to generate a hot discussion is to pose a controversial issue and ask by a show of hands how many students take one side or the other (e.g., "How many of you feel that . . . is true? How many feel it is false?" To control the discussion, ask for five statements of evidence or argument from each side, then statements of rebuttal. Write these statements on the board. One of the easiest ways to create controversy is to play devil's advocate when a class comes too quickly to agreement on a complex issue. Students should be informed later that the position you took was for the sake of the discussion only.

Place students in buzz groups. For this strategy, classes are split into subgroups for a brief discussion of a problem. Groups can be asked to come up with one hypothesis that they see as relevant, with one application of their theory to a practical situation.

Ask for responses in writing. Another great way to get discussions going is to ask students to respond to the question you want answered in writing. Usually five minutes is enough time for students to prepare their answers. Encourage them to be creative by using the writing as a chance to brainstorm. Then invite oral responses. Often quiet students or non-native speakers of English will speak up if they have the words in front of them. Also, written responses often lead to more reflective discussions.

Ground Rules

Ground rules can be a way of having students take ownership of the concept of co-creating a classroom environment that is conducive to learning. By getting class consensus on ground rules from the outset, you can be assured of student support and participation and enforcement. Four suggested ground rules are:

1. Participation. Rather than generalize and say "those people" or don't you think, you can encourage students to use statements and speak their own experience. Personalizing discussion invites diverse perspectives from students who often find themselves on the fringe of university life, such as gay, lesbian, and bisexual students; nontraditional-age students; and students of color. You can ask students who know they tend to monopolize discussions to self-monitor and make room for quieter students. At the same time, you can encourage students who tend to be quieter to contribute to enhancing the learning by sharing their perspectives and experiences.
2. Confidentiality. You can encourage students to take concepts and ideas from class and discuss them freely; however, they should suggest that personal stories or issues raised by individuals are to be kept confidential and the property of the class.
3. Respectful listening. You can encourage students with differing points of view to raise questions by listening first. You can point out that if someone raises a point that others disagree with or find offensive, it is important to remember that the human being behind that question or comment deserves respect.

4. No Zapping. Tied to the notion of respect is the ground rule of no put-downs in class, not even the humorous kind called "zaps." To "zap" one person often serves to discourage open and honest exchange of ideas among the whole group.

Maintaining Discussions

Maintaining discussions often means dealing as smoothly as possible with the problems that arise. Here are some common problems with suggestions for how to deal with them:

1. The student who talks too much. A way to approach the avid talker and pull in new participants is to avoid looking in the direction of the student or to structure the discussion in a way that precludes that person's participation, e.g., "Let's hear from someone who has not yet contributed." You might also ask one or more members of the class to act as observers for a few class periods, reporting back their observations to the class. Perhaps assigning the chatterbox to the observer role would help sensitivity. Another strategy is to talk to the student individually outside of class.
2. The student who won't talk. You need to set clear expectations for participation. It is also important to reinforce participation. A way to do this is to provide opportunities for small group discussions. Such discussion groups may put some students more at ease. A second strategy is to ask occasional opinion questions, e.g., "How do you feel about this?" This may encourage participation by reducing students' fear of answering incorrectly. Another strategy is to have students write out their answers to a question. Having words written out may make it easier for a shy or fearful person to speak up.
3. The discussion that turns into an argument. In good, lively discussions, conflicts will often arise. If such conflicts are left ambiguous or unresolved, they may cause continuing trouble. Here are some helpful ways to resolve them:
 - If the solution depends on certain facts, you can ask students to refer to the text or another source.
 - If there is an experimentally verified answer, you can use the opportunity to review the method by which the answer could be determined.
 - If the question is one of values, you may use the occasion to help students become aware of the values involved.
 - You can list both sides of the argument on the board.
 - You can take a strong position as a moderator, preventing students from interrupting each other or speaking simultaneously.
 - You can refer back to the ground rules already in place for discussions, such as asking students to focus conflict on ideas rather than on people and to resist being judgmental.
4. Unclear or hesitant comments. You can encourage students making unclear contributions to give examples or restate points for verification or rejection by that student, encourage hesitant comments by enthusiastic nonverbal cues and patience, or asking for elaboration and examples at appropriate points.

5. The discussion that gets off track. Some instructors keep discussions on track by listing the questions or issues they want to cover on the board or summarizing the discussion on the board as it progresses. Stopping and asking a student to summarize where the discussion is at the point it appears to go off track may also help.
6. The student who attacks the instructor. When students argue for the sake of arguing, you will almost always lose if they take the bait. This situation often occurs when instructors are going over exams or assignments. Students who attack usually want attention, so simply giving them some recognition while firmly moving on often takes care of the problem. If students are simply trying to embarrass you, they may seek to put you on the defensive with such comments as, "How do you really know that . . . ?" or "You're really not saying that . . . ?" Such questions can be handled by playing boomerang. You might say, "What I'm saying is . . . , but now I'd like you to share your perspective." Turning the question back to the questioner forces him or her to take responsibility for his or her opinion. Other ways to handle these situations include:
 - Confrontation. You can confront the questioner with his reaction to his behavior. "I am uncomfortable with the indirectness of your questions. What I really hear you saying is. . . ."
 - Active listening. You can paraphrase the message you heard and check out the accuracy of their assumptions before responding.
 - Reframing. The focus can be on clarifying the assumptions behind the person's argument and then inviting him or her to see alternative possibilities.
 - Deferring. Often the best strategy is to invite students to come up after class and arrange for a time to talk about the disagreement further.

Creating Closure

Good discussions end with a summary so that students know what important points were covered. The advantage of active learning techniques such as discussions is that students have the opportunity to verbalize course material for themselves and receive feedback in class from the instructor on how well they understand the material. In addition to showing students why the discussion was important to their learning, a summary provides the opportunity to fill in points that weren't covered and praise the class for the quality of their responses.

Incorporating Writing in Instruction

Writing has always been recognized as an important vehicle through which people not only communicate ideas but also generate them. Writing, then, can be used as an inherent part of learning, creating occasions for students to fit new information into their existing knowledge structure and to expand their ways of thinking. The importance of writing in the thinking process implies that it should occur in courses throughout the curriculum, a belief that is implicit in the University "Writing Across the Curriculum." The development of writing skills is an essential accomplishment of a college graduate for which all instructors, not just those in English departments, have responsibility.

Most instructors, feeling that they have not had specialized training in the teaching of writing, are uneasy about the role they are being asked to play. They are also reluctant to add the grading of great amounts of written work to the existing workloads. Fortunately, experts in the field are able to provide reassurance on both counts. The emphasis on writing as process stresses the role of the instructor as facilitator of the thinking process rather than as "guardian of the semicolon," the technical expert on points of grammar. Suggestions for setting and responding to writing assignments in ways to engage students without creating excessive burdens on the instructor are also available. They revolve around two main thoughts:

1. Writing assignments need not be formal or lengthy. Writing as a medium for actively engaging students in learning can be used as a tool for discovery and understanding in an ongoing way that is integral to course activities. For example, an instructor might ask students to take a minute to write down their ideas before they respond to a question posed in class. The instructor might ask the students to write a short summary of what they have learned in class or any questions that they still have about the material after class. Good writing assignments are meaningful, related to the goals of the course, clearly defined, and practical for both the student and the instructor.
2. Not all written work needs to be graded. In fact, instructors who give only formal written assignments to be graded perpetuate the notion that writing is only an end product of learning rather than a tool to be used in the process. Writing can be incorporated into the class to serve several different functions, including a feedback and class management tool for the instructor; a way of having students reflect back on their learning, themselves, and their audience; and a means of sharpening students' written skills.

As a feedback device, you might want to think about using an anonymous one-minute reaction paper at the end of class or after a particularly intense discussion to solicit input and to test for understanding. The results can be reported back to the class at the next session and/or incorporated into the course design.

Journals can help students reflect back on unresolved questions and conflicts raised for them in class, and they can also assist students to see how they have grown during the life of the course. These journals can also serve to personalize the classroom learning if they are turned in periodically or midterm for instructor comment or response.

Finally, writing can help students see issues from diverse perspectives by stretching them to write with the perspective of the other in mind.

To incorporate writing as an integral part of the learning process, instructors can suggest a variety of ways in which students can write as the course progresses. Ways that have been used effectively across courses include:

Reading Journals

You can suggest that students keep journals to chronicle their understanding of texts that they are reading for class. Students can be encouraged to write entries that reflect the main idea of the reading, major points that are covered, and the questions that they have after reading the text. To

increase the level of cognitive activity involved in the reading assignments, you might suggest that students write about possible applications of the ideas, ways in which the material fits with other course readings. You may elect to review these journals periodically, reacting to points that they find particularly interesting, or you may look at the journals as personal aids to scholarship for the use of the students alone.

The Precis

You might ask students to write a very brief summary of the major points of a reading assignment or class session. Often, you may wish to specify a certain word limit, such as 25 words, in order to stretch students' language skills and cause further reflection on the material. Once again, these may be collected—they may serve as an attendance check or to motivate students to keep up with their reading—or they may be used only to focus a discussion or for the students' personal use. When collected, they may be graded very quickly. Elaborate comments do not have to be given if the precis paragraphs are viewed as formative documents.

Brainstorming/Free writing

You can ask students to jot down ideas very quickly in response to a given problem or stimulus. They should be encouraged to focus on generating ideas rather than worrying about the format that their writing takes. Brainstorming can be used prior to the introduction of new material to enhance discovery and curiosity. You might ask students to guess the causes of an historical phenomenon before they are discussed in class. You may ask students to predict the results of a scientific experiment before it is demonstrated. The lists that result can be shared in groups or in class before the material is formally discussed. Brainstorming and free writing can also be used as effective summarizing techniques. Students may be asked to compose "laundry lists" of things to remember when diagnosing a certain virus or characteristics of abstract art. They can compare lists to supplement their own with those of their classmates or to correct misinterpretations. Once again, these assignments are most effective when they are viewed as part of the learning process rather than as end-point assessment devices.

Papers

Although the formal term paper can be a valuable learning activity for many courses, some instructors who once gave their students long research papers are discovering that assigning one or more five-page papers, usually requiring some sort of analysis of ideas or readings, is both easier to evaluate and more useful for their students' learning. To focus students' work, it is helpful to pose a direct question, e.g., "What problems do sociologists encounter in defining "deviance" and convey as clearly as possible the instructor's expectations concerning the appropriate style and tone of the writing, the desired length, and the kind of documentation required. Exemplary papers written by students from prior courses can be made available for students to refer to. If the assignment calls for a prescribed format, such as a laboratory report, an outline of the format or examples of good lab reports will help the students. They may also be encouraged to look in scholarly journals in the discipline for examples of writing to use as models. When longer papers are assigned, instructors have found that requiring drafts in advance of the final paper helps students to pace themselves better and give the instructor a chance to provide direction while the ideas are still in process so that the resulting final papers are of higher quality. Drafts also give instructors the opportunity to note stylistic and grammatical

problems for students to correct so that they learn about writing while they are engaged in a specific revision task, rather than in the abstract.

Special Active Teaching Situations

Some instructional situations involve, by their very nature, active learning. Examples of such situations include studio, performance areas (perhaps where students are working on a creative project), field studies, or laboratory situations. While the dynamics of the student-teacher relationship and the criteria for improving it remain essentially the same as in traditional situations, the following points could also be considered. Working with students in active teaching situations is especially challenging, and an appropriate teacher-student relationship, clearly understood by both parties, becomes particularly necessary.

Teaching in the Lab

1. When preparing a lab assignment, you might take a moment to view it from a student's perspective. It is important to look for ambiguities and poorly designed procedures that may give the students trouble, and to think about whether they will understand the exercise. The best way for you to troubleshoot a lab is to do a trial run yourself. It is also most important to have students read through the assignment before coming to lab since time is always tight, and they can come prepared to begin. An effective oral presentation should include all the information needed to understand and complete the assignment. As you prepare the presentation, you might stop and ask yourself whether you would understand if you were a student.
2. When teaching a lab, it is easy to become a solitary figure at the front of the lab, doing nothing unless people approach you with questions. A better strategy is to walk around the lab and talk with students, acting as their guide to the information rather than just answering their questions. They can be asked about obscure points from the lecture so that you can understand better if they know what they are doing. This way, you can also help students prepare for their exam. When offering information, it is important for you to be wary of talking over the heads of some of the students, especially if the information is pivotal to the basic understanding and completion of the lab exercise. Scientific vocabulary is a significant stumbling block; it is perhaps better to emphasize the concepts and gradually introduce the terminology that students should use to discuss those concepts.
3. It is often a good idea to have students work together, either formally or informally. In this way, they can help each other learn the material, share equipment and good preparation, and answer each other's questions. When they are working in groups, instructors are advised to check on the progress of each individual in the group, encouraging everyone to participate and making it everyone's responsibility to help other group members understand the material.
4. Good teachers stay organized and help their students to be organized too. It is important to know where equipment and reference material are located, to make careful note of any missing or damaged supplies and equipment and take of it right away rather than waiting until the next lab. Checking on how students organize their data collection, written work, and drawings helps keep them on track. It is also useful to remind them how much time remains,

what needs to be accomplished, and to allow for clean-up time. Safety rules should be established, and the instructor should make sure the students follow all the safety rules and guidelines.

Teaching in the Studio

Studio situations present their own distinctive problems. Often, especially in performance areas, the role of individual judgment becomes extremely significant, and the teacher has some hard questions to answer before the course begins. For example, instructional objectives take on particular importance when a teacher must consider whether talented performers who do little work will be judged equally as less talented performers who must work hard to achieve the same level of performance (for a discussion on the problems of performance evaluation, see the section on grading). Although much will vary depending on the precise instructional situation, the following guidelines may help:

1. Performance classes need to be planned carefully. The instructor is advised to determine in advance, and clearly communicate to the students, how the importance of such issues as talent, level of achievement, attitude, effort, and attendance will be viewed. One major dilemma is the relative importance of process and product in the course. Will the instructor feel that the students have achieved the course goal if they demonstrate excellent process, even if their final product is bad? Does the instructor care just about the quality of the artwork produced, or is the instructor equally (or more) interested in how the product was arrived at? Such issues require serious consideration before the syllabus is even written. Whatever the decision, the instructor is advised to make sure all students have an attainable goal for the course, however much talent or inherent ability they may have.
2. If process is of interest, you need to determine some way that it can be measured, both for evaluation and improvement, and build this into the course. Other than personal observation and assistance, dancers or actors might be required to keep a rehearsal log, or artists may be asked to keep a journal listing the dates and reasons for major breakthroughs in the project. You might give quizzes on readings or require students to turn in rough drafts, plans, or outlines as ways of documenting process.
3. When giving feedback, it is important to do so constructively—this is particularly important when a student may have a good deal of emotional investment in a creative project. It is imperative to restrict criticisms to things that the students can do something about (this restriction may require more conscious effort than the instructor expects), and to help them overcome the barriers that only appear to be insurmountable.
4. Instructors can work on recognizing potential. Some students will be obviously talented in the studio area; others will have abilities that have not yet surfaced. It is the teacher's job to pull that talent out into the open and not to make snap judgments.
5. It is especially easy in performance areas for a teacher to take on the role of a parent. While nurturing students is obviously important, it is equally important not to be patronizing about their achievements. Similarly, although students may be fellow artists at a difficult point in their careers, it is crucial to retain as much neutrality as possible when it comes to their performances and not become too emotionally or personally vested in their creative growth.

Other Instructional Strategies for Actively Involving Students

Problem Solving

A traditional part of courses in such fields as mathematics and physics, the use of problems as a strategy for active engagement and practice has extended to other fields as well. Problem-based teaching involves structuring learning around some central questions or skills involved in the discipline. Often, however, the instructor's task is more elaborate than simply isolating good problems. An essential part of helping students to solve problems is the creation of an effective climate that is conducive to risk taking and the free exchange of ideas. Direct instruction in the techniques of problem solving is also often required for students who have not had much problem-solving experience. The instructor will need to model how professionals in the field go about defining problems, gathering data, generating hypotheses, and supporting conclusions or solutions. In addition, researchers in teaching problem solving have found that helping students to be aware of their problem-solving strategies is a characteristic of effective teachers. Often, having students "talk through" a problem out loud or work in pairs or groups increases their problem-solving skills.

A poor way to approach teaching problem solving is for the instructor to do all the problem solving. While modeling is important, it is also important for students to try to apply their skills while the instructor is there to monitor their work and offer them assistance.

Following an instructor demonstration of a particular problem-solving approach with an opportunity for students to try a similar problem right away is a very effective way to teach. Students can be asked to come to the board or overhead to show the steps they used, to switch papers with another student and compare work, or to list aloud the steps they used and the solution they reached. The results will be much better than a prolonged demonstration during which the instructor is repeatedly solving the problems for the students.

Case Studies

Very broadly defined, a case study is a teaching instrument that portrays a real life situation for student analysis. Case studies are used frequently in professional schools to enable students to develop their skills in analyzing situations and making sound decisions, but cases are becoming very popular in other divisions as well. Often, a prepared case can be used, but when new cases are developed, the instructor should focus on an important dilemma or issue, create enough detail for the students to comprehend the case, and choose a situation about which there is room for debate and several possible courses of action. Students are asked to read the case before class. During the class session the instructor first makes sure that the students understand the details of the case, then leads them through an analysis of the problem and discussion of possible alternative courses of action. The instructor serves as discussion facilitator, probing for detail, support for arguments, evidence, and the generation and critique of solutions.

Peer Learning

Classes can be divided into groups of about five students with a mixture of more and less knowledgeable students in each group. The groups are given learning tasks that will require them to share knowledge and experiences. The task may be to answer some review questions, to pose

some critical issues about a topic, to solve a problem, apply some principles, or create a product. If the groups are balanced well, the task is clearly outlined, and the allocated time is appropriate for the task, the group will engage in peer learning and increase their abilities to function in an interpersonal setting through the process. The instructor's role is to serve as designer by carefully structuring the groups and tasks and to serve as facilitator while the groups are working, helping with interpersonal or task-related problems as they arise.

Learning Cells

Learning cells are a variety of peer learning that can be used when it is important to have students verbalize what they have read. Reading assignments are given before class and part of class time is spent with students in pairs telling each other what they read. The students may have read the same material beforehand, in which case they are demonstrating their comprehension and recall and getting an opportunity to clarify their understanding with one another, or they may have been assigned different readings, in which case they can complement each other's knowledge with some different information or perspectives.

Discover Format

In a discovery or inquiry format, the instructor sets up a novel situation, an interesting puzzle, or an open-ended question that students are asked to explore using their own creativity and resources. They may be asked to hypothesize, based on only partial information, or on what building materials were used to construct an ancient building; they may be asked to construct a device for measuring something or making certain musical tones; or they may be asked to interview each other about what triggers depression in their lives. The instructor once again serves as the designer of the activity, choosing activities that are likely to lead students to accomplish a learning goal, and as facilitator during the process, helping students to stay on course and to locate the resources they need. In the discover format, it is important for the instructor to stay as nondirective as possible so that students develop independence and personal excitement.

Role Playing

In many courses, role-playing can be used to develop empathy, to enliven an historical, philosophical, or literary topic, or to provide a concrete enactment of an abstract topic. Volunteers are asked to portray certain roles and given sufficient information on the context to enable them to improvise dialogue and actions. In some classes, the instructors have attended class in the role of a character and have enlisted colleagues to join them in enacting a situation for the students. The class is asked to play the role of those in the situation as well, asking questions or engaging in dialogue in ways that would be appropriate for the setting. Role playing is not limited to classes in the humanities or social sciences; creative instructors in the physical sciences have used students to model DNA or demonstrate chemical bonding by joining together in the appropriate configuration.

Class Debate

Using a central aisle or a real or imaginary boundary to divide the class space in half, the instructor poses a debatable proposition and asks those who agree to sit in one section and those who disagree to sit in the other. (The instructor may also want to create a third section for those who are undecided.) The instructor then moderates, asking students from one section, then the

other, to support their position. At set intervals of perhaps fifteen minutes, students are given the opportunity to move to another section, based on whether they have changed their position through listening and participating in the debate. A variant on this theme is to have students argue for the opposite of their original positions by changing the section designations after the students have already chosen positions. The instructor is responsible for setting up the proposition, enforcing the rules, and summarizing the discussion and results of the debate.

Simulations

Simulations allow students to engage in learning activities that may otherwise be too time consuming, too expensive, or ethically questionable (requiring animals or intervention into human behavior). Using an established game or computer software or creating a scenario, the instructor develops a simulated environment within which the students will engage in activity directed toward a learning goal. They may be asked to set up companies and create mergers; they may be asked to develop marketing packages that they will present to real or simulated client; they may be blindfolded to experience sightlessness; or they may be required to recreate a military battle or other historical event using a new strategy. The role of the instructor is to identify and preview established simulations for use in the course or to create scenarios that are likely to engage students in experiential learning directed toward a course goal. During the simulation, the instructor serves as a facilitator.

Learning in Groups

Many of the strategies mentioned in this section involve having students work in groups of two or more. The benefits of peer learning have been extolled in many recent reports (see "Useful Sources on Active Learning") and include encouraging student independence, giving students the opportunity to affirm their learning through teaching another and providing student with other styles of teaching or modes of expression that may be more accessible to them.

Peer learning, especially in learning groups, requires good planning in order to be successful. First, group work as a learning strategy must be appropriate for the course objective. Second, the group task must be clearly outlined, must be feasible, and must be relevant to the course goals. It often helps to provide students with an explicit rationale for the choice of group work. Third, group membership must be determined carefully and positive social interaction within the group must be maintained. Often, teachers assign groups based on knowledge of students' abilities or social skills. Some teachers assign specific roles, such as task director, timekeeper, social monitor, and reporter to group members. Fourth, group work must be assessed appropriately. Some instructors ask students to rate each other's performance, and some ask for self-evaluation. Most give students some combination of individual and group grade, although for some tasks, one or the other is chosen.

The Special Case of Large Enrollment Instruction

Although large classes present special challenges for active learning, they do not have to be strictly presentational in nature. Even though, in many cases, large lecture courses provide for

discussion or recitation sessions to be held at intervals, the lecture itself does not have to be a totally passive experience. In fact, a number of studies suggest that most learners cannot attend well to lecture content for more than fifteen minutes. It therefore becomes incumbent upon the lecturer to build in change of pace strategies into the design of each class. Lectures can be broken into segments simply by stopping and asking for discussion at given intervals. Some other strategies for active engagement during large classes include:

1. Asking students to take a minute to write. They may be asked to summarize in their own words what the instructor has been saying, to solve a short problem, "Why was so much sandstone used in this architecture?" to apply a concept, "What method would you use to date this artifact?" or to evaluate an idea, "Does Brown's theory describe human action as you know it?" The written piece may be collected and used to document class participation and attendance. It may also go uncollected; it may be exchanged with a classmate who can respond to it; or it may be used as a stimulus to a discussion in which students are asked to share what they have written.
2. Asking students to talk with each other. Even when seats are fixed, students can turn to partners and exchange ideas at given intervals. As with the writing assignments, they may be asked to recap what has been said, solve a problem, apply a concept, or state an opinion.
3. Taking a vote or census. When appropriate to the content, instructors can ask simple questions such as: "How many think this object will float?" or "How many of you are taller than both your parents?" These short questions can renew attention and further student engagement without taking a lot of time.

Summary

The particular learning strategies and activities that are selected for engaging students actively will depend on the context of the specific course and student preparation with which the strategies are employed. Given the wide variety of strategies available, however, there are ways to pervade every course with opportunities for students to become actively involved in learning during class time. In addition to increasing motivation and providing feedback at crucial points, strategies that engage students help to develop the competencies of reading, speaking, writing, critical thinking, and problem solving that are marks of a well-educated person.

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Constructing Tests

One of the most important parts of a successful learning experience is the opportunity for learners to play back to teachers their growing understanding of the information or processes they are learning. Through this opportunity, they can articulate their growing knowledge and receive correction, if needed, from the teacher. At the same time, teachers can learn how effective they have been in facilitating learning for their students and can use this information to revise their instructional practices.

Unfortunately, testing is more often used to justify the assignment of letter grades than to serve as a diagnostic tool. As Svinicki (1976) points out, there are at least two kinds of occasions when testing for diagnosis is important. One is at the beginning of a course or given segment of a course when it is appropriate to assess what the learners already know about what is to be learned. At these times, a pretest can help the instructor to know the strengths and weaknesses of the learners and can suggest ways to modify learning activities accordingly. Another use of diagnostic testing is the administration of frequent short self-tests to enable students to judge their performance while they are learning. If constructed in such a way that they force students to become more aware of the thinking process they use, diagnostic tests can help students develop their skills. These tests can also provide the kind of rapid and frequent feedback that is so important to learning.

Different kinds of tests are appropriate in different settings. Performance testing is very important where the learning goals involve the acquisition of skills that can be demonstrated through action. In such areas as music, theater, art, dance, medicine, and physical education, much of the learning will be demonstrated through assessment of actual performance. The common type of test in college settings, however, is the pencil and paper test, about which much has been written.

This section will discuss general testing conditions, then give some guidelines for performance testing, and will, finally, focus on the paper and pencil test as it is used most routinely—for the purpose of assessing learning at the on an instructional segment.

General Tips about Testing

It is best to integrate test construction with other course planning activities. An essential part of each component of instruction is a method for evaluating student progress. In performance areas, instructors can plan tests that will ask students to demonstrate learning of a given sequence, technique, or skill. In areas where written tests are used, instructors can compose test items as they progress through the term, rather than all in one sitting. Doing so helps to avoid fatigue later on and will result in items that are presented closer to the way in which the information was discussed in class.

It is often advantageous to mix types of items (multiple choice, true/false, essay) on a written exam or to mix types of exams (a performance component with a written component).

Weaknesses connected with one kind of item or component or in students' test-taking skills will be minimized.

It is helpful for instructors to test early in the term and consider discounting the first test if results are poor. Students often need a practice test to understand the format that each instructor uses and anticipate the best way to prepare for and take particular tests.

Frequent testing helps students to avoid getting behind, provides instructors with multiple sources of information to use in computing the final grade (thus minimizing the effect of "bad days", and gives the students regular feedback.

It is important to test various topics in proportion to the emphasis they have been given in class. Students will expect the practice and will study with this expectation.

On written exams, it is important to proofread exams carefully and, when possible, have another person proofread them. Tiny mistakes, such as misnumbering the responses, can cause big problems later. Collation should also be checked carefully, since missing pages can cause a great deal of trouble.

It is recommended that instructors be cautious about using tests written by others. Often items developed by a previous instructor, textbook, publisher, etc., can save a lot of time, but they should be checked for accuracy and appropriateness in a given course.

If enough test items are developed and kept out of circulation between tests, it is possible to develop a test item bank from which known effective items can be reused on multiple versions or offerings of a test.

Generally, on either a written or performance test, it is wise to avoid having separate items or tasks depend upon answers or skills acquired in previous items or tasks. A student's initial mistake will be perpetuated over the course of the succeeding items or tasks, penalizing the student repeatedly for one error.

Instructors have found that using a little humor or placing less difficult items or tasks at the beginning of an exam can help students with test anxiety to reduce their preliminary tension and thus provide a more accurate demonstration of their progress.

A good way to detect test errors in advance is by pilot testing the exam. Instructors can take the exam themselves or ask colleagues or former students to critique it.

It is important to anticipate special considerations that learning disabled students or nonnative speakers may need. The instructor needs to anticipate special needs in advance and decide whether or not students will be allowed the use of dictionaries, extra time, separate testing sites, or other special conditions.

Instructors can minimize interruptions during the exam by writing on the board any instructions or corrections that need to be made after the exam has begun and calling students' attention to

them. Before the exam, students can be informed that they should check the board periodically for instructions or corrections.

Planning the Test

A good test reflects the goals of the course. It is congruent with the cognitive or psychomotor skills that the instructor wants the students to develop and with the content emphasis that has occurred during the instruction. If, for example, the instructor has been mainly concerned with having students memorize a body of factual material, the test should ask for recall of this material. If the instructor has been trying to develop analytic abilities in the students, a test that asks for recall is inappropriate and will cause the students to conclude that memorization is the instructor's true goal. Similarly, if the instructor has focused on the War of 1812 in the majority of the class sessions and activities, this emphasis should be reflected in the test. A test that covers a much broader period will be regarded as unfair by the students, even if the instructor has told them that they are responsible for material that has not been discussed in class. Students go by instructors' implicit values more than their stated ones.

Performance Testing

Across the various fields in which performance testing is the most appropriate way to judge student progress, different kinds of tests will be appropriate, but some general guidelines are listed here:

1. It is important to base the test on the specific skills or competencies that the course is promoting. A course in family therapy, for example, might include performance tests on various aspects that are covered in the course, such as recording client data, conducting an opening interview, and conducting a therapy session. Developing a performance test involves isolating particular demonstrable skills that have been taught and establishing ways in which the level of skill can be assessed for each student. One might, for example, decide that the best way in which a student can demonstrate counseling skills such as active listening would be to have the student play the role of therapist in a simulated session.
2. It is best to define the task as clearly as possible. Rather than simply alerting the students to the fact that their performance will be observed or rated, it is helpful to give more precise instructions on how the test will be structured, including how long they will have, the conditions under which they will perform the task, and other factors that will allow them to anticipate and prepare for the test. If possible, it is best in setting up a new testing situation to ask a student or colleague to do a trial run before using the test with students so that unanticipated problems can be detected and eliminated.
3. Good performance tests identify criteria on which successful performance will be judged and specify these in advance. For curriculum areas in which it is possible to clearly define mastery, such as, "the student will be able to tread water for five minutes," it is desirable to do so. In most areas, however, effective performance is a complex blend of art and skill, and particular components are very subtle and hard to isolate. In these cases, it is often useful to try to highlight some observable characteristics and to define what would constitute adequate

performance. In a test of teaching, for example, students might be expected to demonstrate clarity, organization, discussion skills, reinforcement of student responses, and so on. Operational definition for specific components to be evaluated may be phrased like the following excerpt from a teaching observation checklist: "Praises student contributions--the teacher acknowledges that he or she values student contributions by making some agreeable verbal response to the contributions. The teacher may say, 'That' is a good point, 'Yes, thank you,' 'Thanks for raising that, 'Right, well done,' and the like." Such information is helpful to the student as well as to the instructors who will be rating the performance.

4. It is important to give the same test or kind of test to each student. When possible, it is best to arrange uniform conditions surrounding a performance-testing situation. Students can be given the same materials to work with, or the same task. Often, however, particularly in professional practice situations, it is hard to control the context of a performance-testing situation. One nursing student may be evaluated while dealing with an especially troublesome patient while another will be working with a helpful patient. In these situations, documenting and allowing for the contextual differences on the performance is an extremely important part of the evaluation.

The effectiveness of performance testing, then, is directly related to how appropriate the test is, the given course objectives; how clearly the tasks are defined; how well the criteria for successful performance have been identified and conveyed; and how uniform the testing is for all students involved. The section on grading contains a discussion on grading students in a performance situation.

Pencil and Paper Tests

Limited-Choice vs. Open-ended Items

The age old question is "Are essay tests better than objective tests?" The answer, of course, depends on the circumstances and on the goals of the test. The advantages and disadvantages of two main types of test items are discussed in this section in terms of the various issues that will often be considered when a test is being developed.

The term "limited-choice" will be used here to describe test questions that require students to choose one or more given alternatives (multiple choice, true/false, matching columns), and "open-ended" will be used to refer to questions that require students to formulate their own answers (sentence completion, short answer, essay). This avoids implying that one type of question is automatically "objective" and the other necessarily "subjective"—a faulty assumption. Following are some comparisons of the two types of test items:

Level of Learning Objective

In principle, both limited-choice and open-ended items can be used to test a wide range of learning objectives. In practice, most people find it easier to construct limited-choice items to test recall and comprehension, and open-ended items would test higher-level learning objectives. But other possibilities exist. Limited-choice items that require students to do such things as classify statements as fact or opinion go beyond rote learning, and focused essay questions can easily stay at the recall level.

Content Coverage

Since more limited-choice than open-ended items can be used in exams of the same length, it is possible to sample more broadly over a body of subject matter with limited-choice items. A small number of open-ended items that are broad in scope and call for the inclusion of many specifics can also test subject matter comprehensively, however.

Practice and Reward of Writing and Reading Skills

A long-term goal of many learning tasks in higher education is the cultivation of students' reading and writing skills. Limited-choice items give virtually no practice in writing, while open-ended exams, particularly short-answer and essay, provide opportunities to improve writing. Open-ended exams, therefore, give students with good writing skills an advantage over those who do not have these skills, and limited-choice exams do not favor students who write well. They do, however, favor students who read well, since these students have the skills to attend to keywords, recognize logical qualifications and cues, and discriminate among close choices.

Practice and Reward of Creativity and Divergent Thinking

Open-ended items, especially essay questions, can provide far more opportunity for creative or divergent thinking than limited-choice items. However, this depends on how the item is written since an essay question can call for convergent thinking, such as reaching a set solution to a problem situation. An argument often made about limited-choice exams is that they not only fail to foster, but actually penalize, divergent thinking.

Feedback to Teacher and Student

Limited-choice exams allow for faster feedback than open-ended exams. Open-ended exams, however, usually are more revealing to the teacher about specific student strengths and weaknesses in processes such as comprehension and reasoning and can occasion more dialogue if teacher and student use this possibility.

Length of Exam

Many limited-choice items can be answered in the amount of time it takes to answer open-ended items (sentence completions, short answers) thus are more appropriate for short quizzes and exams than essay questions.

Size of Class

Unless graders are available, it is very difficult to give frequent open-ended exams and provide timely feedback in a high-enrollment course. Exams that consist mainly of limited-choice items are usually more practical under these circumstances.

Reliability in Grading

Open-ended exams are much harder to grade reliably (consistently) than limited-choice exams. However, to enhance reliability, one can use such methods as establishing model answers and holistic scoring.

Exam Construction and Grading Time

While it takes time to construct open-ended items well, it generally is much more time consuming to construct limited-choice items both because many more items are needed for the average exam and because it is extremely difficult to write good items. Experienced test constructors report producing as few as one to three "good" limited-choice items per hour. While it is easier to generate open-ended items, it is more time consuming to grade them than limited-choice items. One exam consisting of only open-ended items may take as long to grade an entire set of exams made up of limited-choice items. If the limited-choice exams are mechanically scored, the differences are even more extreme.

Reusability of Exam

In general, exams consisting of a large number of limited-choice items are easier to reuse than those consisting of only a few essay questions since it is harder in this case for students to remember and transmit the questions to others who will take the exam after them (if the printed exam does not get into circulation). If a large item bank is built and different exams can be randomly generated from the same pool of questions, limited-choice items are highly reusable.

Prevention of Cheating

Limited-choice exams provide easier conditions for cheating than open-ended exams, since single letters or numbers are far easier to see or hear than extensive text. Cheating can be minimized in several ways, however, such as using alternative test forms and controlling seating.

Writing Test Items

In the discussion of limited-choice items below, the term stem is used to refer to the part of the item that asks the question. The terms responses, choices, options, and alternatives are used to refer to the parts of the item that will be used to answer the question. For example:

Stem Who is the author of Jane Eyre?

Responses

- A) Emily Bronte
- B) Charlotte Bronte
- C) Thomas Hardy
- D) None of the above

Multiple-Choice Items

Multiple-choice items are considered to be among the most versatile of all item types. They can be used to test factual recall as well as level of understanding and ability to apply learning.

Multiple-choice items can also provide an excellent basis for post-test discussion, especially if the discussion addresses why the incorrect responses were wrong as well as why the correct responses were right. Unfortunately, they are difficult and time consuming to construct well. They may also appear too discriminating (picky) to students, especially when the alternatives are well constructed, and are open to misinterpretation by students who read more into questions than is there.

Suggestions for Constructing Multiple-Choice Exams

1. Use the stem to present the problem or question as clearly as possible.
2. Use direct questions rather than incomplete statements for the stem.
3. Include as much of the item as possible in the stem so that alternatives can be kept brief.
4. In testing for definitions, use the term in the stem rather than as one of the alternatives.
5. List alternatives on separate lines rather than including them as part of the stem so that they can be clearly distinguished.
6. Keep all alternatives in a similar format (i.e., all phrases, all sentences, etc.).
7. Make sure that all options are plausible responses to the stem. (Poor alternatives should not be included just for the sake of having more options.)
8. Check to see that all choices are grammatically consistent with the stem.
9. Try to make alternatives for an item approximately the same length. (Making the correct response longer is a common error.)
10. Use misconceptions students have indicated in class or errors commonly made by students in the class as the basis for incorrect alternatives.
11. Use "all of the above" and "none of the above" sparingly since these alternatives are often chosen on the basis of incomplete knowledge.
12. Use capital letters (A, B, C, D, E) as response signs rather than lower-case letters ("a" gets confused with "d" and "c" with "e" if the type or duplication is poor).
13. Try to write items with equal numbers of alternatives to avoid asking students to continually adjust to a new pattern caused by different numbers.
14. Put the incomplete part of the sentence at the end rather than at the beginning of the stem when using a statement rather than a direct question.
15. Use negatively stated items sparingly. When they are used, it helps to underline or otherwise visually emphasize the negative word.
16. Keep the number of alternatives at five or fewer. The more alternatives used, the lower the probability of getting the correct answer by guessing. Beyond five alternatives, however, confusion and poor alternatives are likely.
17. Make sure there is only one best answer or correct response to the stem.
18. Randomly distribute correct responses among the alternative positions so that there are no discernible patterns to the answer sequence, and a nearly equal proportion of As, Bs, and Cs.

True/False Items

True/false items are relatively easy to prepare since each item comes rather directly from the content. They offer the instructor the opportunity to write questions that cover more content than most other item types since students can respond to so many in the time allowed. They are easy

to score accurately and quickly. True/false items, however, may not give a true estimate of the students' knowledge since half can be answered correctly simply by chance. They are very poor for diagnosing student strengths and weaknesses and are generally considered to be "tricky" by students. Since true/false questions tend to be either extremely easy or extremely difficult, they do not discriminate between students of varying ability as well as other types of questions do.

Suggestions for Constructing True/False Items

1. Keep the language as simple and clear as possible.
2. Use a relatively large number of items (75 or more when the entire test is T/F).
3. Avoid taking statements verbatim from the text.
4. Be aware that extremely long or complicated statements will test reading skills rather than content knowledge.
5. Require students to circle or underline a typed "T" or "F" rather than to fill in a "T" or "F" next to the statement, thus avoiding having to interpret confusing handwriting.
6. Avoid using negatives, especially double negatives.
7. Avoid ambiguous and trick items.
8. Make sure that the statements used are entirely true or entirely false. Partially or marginally true statements cause unnecessary ambiguity.
9. Use certain key words sparingly since they tip students off to the correct answers. The words all, always, never, every, none, and only usually indicate a false statement, whereas the words generally, sometimes, usually, maybe, and often are frequently used in true statements.
10. Use precise terms, such as 50% of the time, rather than less precise terms, such as several, seldom, and frequently.
11. Use more false than true items, but not more than 15% more. False items tend to discriminate more than true items.

Matching Items

Matching items are generally quite brief and uninvolved and are especially suitable for who, what, when, and where questions. They can, however, be used to have students discriminate among and apply concepts. They permit efficient use of space when there are a number of similar types of information to be tested. They are easy to score accurately and quickly. Among the drawbacks of matching items are that they are difficult to use to measure learning beyond recognition of basic factual knowledge; they are usually poor for diagnosing student strengths and weaknesses; they are appropriate in only a limited number of situations, and they are difficult to construct since parallel information is required.

Suggestions for Constructing Matching Items

1. Use only homogeneous material in a set of match items (i.e., dates and places should not be in the same set).
2. Use the more involved expressions in the stem and keep the responses short and simple.
3. Supply directions that clearly state the basis for the matching, indicating whether or not a response can be used more than once, and stating where the answer should be placed.

4. Make sure that there are never multiple correct responses for one stem (although a response may be used as the correct answer for more than one stem).
5. Avoid giving inadvertent grammatical clues to the correct response.
6. Arrange items in the response column in some logical order—alphabetical, numerical, and chronological—so that students can find them easily.
7. Avoid breaking a set of stems (stems and responses over two pages).
8. Use no more than 15 items in one set.
9. Provide no more responses than stems to make process-of-elimination guessing less effective.
10. Number each stem for ease in later discussions.
11. Use capital letters for the response signs rather than lower-case letters.

Completion Items

Completion items are especially useful in assessing mastery of factual information when a specific word or phrase is important to know. They preclude the kind of guessing that is possible on limited-choice items since they require a definite response rather than simple recognition of the correct answer. Because only a short answer is required, their use on a test can enable a wide sampling of content. Completion items, however, tend to test only rote, repetitive responses and may encourage a fragmented study style since memorization of bits and pieces will result in higher scores. They are more difficult to score than forced-choice items, and scoring often must be done by the test writer since more than one answer may have to be considered correct. On the whole, they have little advantage over other item types unless the need for specific recall is essential.

Suggestions for Constructing Completion Items

1. Use original questions rather than taking questions directly from the text.
2. Provide clear and concise cues about the expected response in the statement.
3. Use vocabulary and phrasing that comes from the text or class presentation.
4. When possible, provide explicit directions as to what amount of variation will be accepted in the answers.
5. Give much more credit for completions than for T/F or matching items.
6. Avoid using a long quote with multiple blanks to complete.
7. Require only one word or phrase in each blank.
8. Have students write their responses on lines arranged in a column to the left of the items.
9. Ask students to fill in only important terms or expressions.
10. Avoid providing grammatical clues to the correct answer by using a/an, etc. instead of specific modifiers.

Essay/Short Answer Items

The main advantages of essay and short answer items are that they encourage students to strive toward understanding a concept as an integrated whole, permit students to demonstrate achievement of such higher level of objectives as analyzing given conditions and critical

thinking, allow expression of both breadth and depth of learning, and encourage originality, creativity, and divergent thinking. Written items offer students the opportunity to use their own judgment, writing styles, and vocabularies. They are less time consuming to prepare than any other item type. Unfortunately, tests consisting only of written items permit only a limited sampling of content learning due to the time required for students to respond. Essay items are not efficient for assessing knowledge of basic choice items. They favor students who possess good writing skills and neatness and are pitfalls for students who tend to go off on tangents or misunderstand the main point of the question. The main disadvantage, however, is that essay items are very difficult and time consuming to score and potentially subject to biased and unreliable scoring.

Suggestions for Constructing Essay Questions

1. Use novel problems or material whenever possible, but only if they relate to class learning.
2. Make essay questions comprehensive rather than focused on small units of content.
3. Allow students an appropriate amount of time. It is helpful to give students some guidelines on how much time to use on each question, as well as the desired length and format of the response, such as full sentences, phrases only, outline, and so on.
4. Inform students, in advance of answering the questions, of the proportional value of each item in comparison to the total grade.
5. Require students to demonstrate command of background information by asking them to provide supporting evidence for claims and assertions.

Useful Sources on College Testing

Cashin, W. E. *Improving Essay Tests*. (Idea Paper, No. 17) Manhattan: Kansas State University, Center for Faculty Evaluation & Development, 1987.

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Student Assessment

Assessing student performance is an important and informative element of teaching well. Because of the difficulties and emotions involved, most instructors are anxious about assessment. Yet there are many benefits connected with assessment. Students benefit from assessment through getting feedback on how well they are learning. Teachers benefit from assessment through learning how well their actions are facilitating learning and what changes or additional approaches they might use to further student understanding. Institutions benefit from assessment through obtaining information on how well overall goals for students are being achieved.

Assessment activities range from simple classroom assessments to institutional efforts to measure change across particular program areas. In this section on student assessment, the focus is on efforts by the instructor. The two primary kinds of assessment are formative assessment, which is designed to provide diagnostic information to learners and their teachers, and summative assessment, which is used to determine final grades or other summary information.

Formative Assessment

It is important that formative assessment be an ongoing part of the teaching process. Since feedback is essential to learning, frequent formative assessment enhances the learning that will take place in a given course. Many instructors build frequent opportunities for self-checks into their teaching: they punctuate their lectures with questions that call upon students to demonstrate their understanding of the topic at hand, they ask students to solve problems after watching a demonstration, or to show how they are interpreting the information they are receiving. Instructors may ask students to keep journals, to demonstrate a particular technique, or relay their understanding to a fellow student. In most of these cases, the assessment activity is not graded and is solely to help learners to understand how well they are doing and help the teacher know how to proceed. Angelo and Cross (1993) provide an extensive inventory of classroom assessment techniques, designed to help instructors and students to diagnose teaching and learning situations.

Bergquist and Phillips (1975) have identified characteristics of feedback for formative purposes:

1. It is descriptive. It focuses on what the individual did rather than personal attributes. For example, instead of saying, "You are so emotional in your writing", the teacher might say, "Your argument was hard to follow, given the use of heated language."
2. It is specific. It points out particular aspects that are good or need improvement. For example, instead of saying, "Good job," the teacher might say, "Your paper was well-researched."
3. It is directed toward behavior that the person can do something about. Instead of saying, "You should have learned this in high school," the teacher can say, "It is important to know about quadratic equations before you go on."
4. It is well timed. Feedback is usually most helpful when it is prompt.
5. It involves the amount of information the student can use rather than the amount that the teacher would like to give. A few well-designed comments on a paper are more effective than a sea of red ink.

6. It involves sharing information rather than giving advice. It is helpful to let the learner decide what steps to take to remediate any problems there are, since ownership and the probability of change are more likely than if a course of action were prescribed by another.
7. It is solicited rather than imposed. When learners have the opportunity to ask for information about their performance, they are more likely to listen to the answer.
8. It takes account of the needs of both learner and teacher. Although teachers sometimes want to express their frustration with the results of an assignment, the needs of the learner must also be met.
9. It concerns the result rather than the reason. When teachers assume why a learner performed a certain way, they can be making false inferences that will damage the relationship. Instead of saying, "You probably didn't study because of the big game," a teacher might say, "this performance is below par for you. Usually you can define terms."
10. It is checked for clear communication. It is a good idea to ask students to paraphrase feedback so that teachers can see whether it corresponds with the message they intended to give.
11. It is an important step toward authenticity. Constructive feedback communicates caring and honesty. It avoids false praise and global blame.

Formulating Effective Methods of Summative Evaluation (Grading)

Many different types of summative evaluation may be effective depending on the design of specific course materials and goals. However, good grading methods are characterized by the following attributes:

Validity

It is of paramount importance that whatever method of evaluation is employed accurately measures the skill or knowledge that it seeks to measure. It is also important that evaluations exhibit what is known as "face validity," which refers to the degree to which elements of the evaluation appear to be related to course objectives. It is a common student complaint that no connection was perceived between the evaluation and course objectives. It is, therefore, necessary not only that the instructor can make a connection between the evaluation and course but also that the student is able to do so.

In addition to face validity, evaluations must have content validity. Regardless of the format of the evaluation, it must conform closely to course objectives. If a course objective states that students will be able to apply theories of practice to case studies, then an evaluation should provide them with appropriate cases to analyze. Finally, effective methods of evaluation have certain predictive characteristics. A student who performs well on an evaluation concerning a certain skill might be expected to perform well on similar evaluations on related skills. Additionally, that student would be expected to score consistently when evaluated in the future.

Reliability

The concept of reliability is closely related to (and often confused with) validity. A reliable method of evaluation will produce the same results (with certain limitations) for the same student across time and circumstances. While it is understood that performances will vary, the goal is to

eliminate as many sources of error as possible. It has been noted that the three biggest sources of error in reliably evaluating students are: (a) poor communication of expectations; (b) lack of consistent criteria for judgment, and (c) lack of sufficient information about performance. It is imperative that the student understand the question or the task assigned. Poor student performance can be the result of a failure to provide clear instructions. For example, assignments should always be written to avoid any verbal misunderstanding. The results of a failure to communicate are often a poor grade to a student who may actually have mastered the subject matter. Lack of consistent criteria for judgment exists where the basis for making the judgment is not clear. Where there are not consistent criteria, identical tasks can be evaluated differently by the same grader at a later date or by a different grader concurrently. However, if a specific set of criteria is established prior to the evaluation, error in this area can be diminished. A third source of error in evaluating students occurs when the instructor does not have sufficient information. It is important that this information reflect a student's performance in a variety of formats. Clearly, using a single paper submitted at the end of the semester to determine the entire course would violate this principle.

Clear Communication of Evaluation Plan

Prior to Performance

A major student complaint has been that the basis for their evaluation has been unclear to them. Students' ability to "guess" what topics will be presented as a part of their evaluation and in what form is hardly indicative of their mastery of course content. Additionally, day-to-day class activities and assignments should be of the same nature and scope as questions employed for evaluative purposes. This is not to say that the evaluation must be a "regurgitation" of classwork and readings, but rather that it should be within the same general framework. Trial tests given early in the quarter, which are ungraded, can be useful tools both to alert the instructor as to the students' abilities and to provide the students with an understanding of the method of evaluation that will be used.

Realistic Expectations

As has been previously noted, the more information available to the instructor the more reliable the evaluation. However, consideration must be given to the fact that students are also enrolled in several other courses that demand their time and attention. Instructors are also limited in the number and types of evaluations they can develop and administer in any individual course, while still grading and returning work in a reasonable time. Ideally, these constraints can be recognized, and the best possible system of evaluation can be generated within these parameters.

Methods of Grading and Relative Advantages

There are many methods of grading. They are all based on human judgment, although it is easy to forget this, especially when the method relies on numbers. Numeric methods are not necessarily more "objective" than those that rely on written comments or holistic approaches.

Instructors find that thinking through their grading philosophy and purposes before developing a scheme is a very important step. Before selecting a grading method, it is also advisable to check if there are any relevant course or departmental policies.

Letter Grading

Letter grading consists, of course, of assigning a letter of the alphabet, sometimes in conjunction with a plus or minus, to students' performance.

Advantages

1. Letter grades are convenient for determining levels of competence for future employment and advanced education.
2. Letter grades provide feedback.
3. Alternatives to letter grades may not result in more effective evaluation.

Disadvantages

1. Grades can be determined by mixing factors that have various weightings.
2. They can divide students into discriminatory and often competitive groups.
3. They can foster dependent, conforming, unimaginative behavior in students.
4. Letter grades can cause threatening situations with an adverse effect on learning.

Satisfactory-Unsatisfactory

Satisfactory-unsatisfactory systems are based on one cut-off point that determines whether the students has passed or failed the course. Of course, instructors must set the cut-off point.

Advantages

1. This system can be more relaxed and less competitive.
2. This system can provide a better atmosphere; students may be willing to take risks with the teacher.
3. Cheating may be reduced.
4. Some students do more work when freed from the pressures of a letter grade.

Disadvantages

1. A passing grade does not distinguish among levels of competence.
2. Some students may work less.
3. It can be difficult to state level of mastery leading to a passing grade.
4. A failing student is still under pressure.

Within the above parameters, there are a variety of approaches that can be used to arrive at the letter grade or the satisfactory/unsatisfactory grade. A few of these are listed below along with some of their relative advantages and disadvantages.

Mastery Approach

The mastery approach assigns a basic satisfactory/unsatisfactory grade to students based on their achievement of specified goals. In a mastery system, students are ordinarily allowed to take

different amounts of time to accomplish a goal and to repeat tests or assignments without penalty until they achieve the desired outcome.

Advantages

1. The grade is meaningful since it is tied to the performance level.
2. When students know their goals, they may achieve them faster.
3. The focus is on success, rather than on failure.
4. This system tends to generate cooperation and may raise morale among teachers and students.

Disadvantages

1. It is more time consuming.
2. It can limit freedom of teachers.
3. Some teachers might too strictly prescribe the way to mastery.
4. This approach discourages students from setting and meeting their own goals.
5. If the total faculty sets up performance criteria, this method has the disadvantages inherent in committees.

Contract System

A contract system of grading involves the development of a written contract between the student and the instructor that specifies precisely what will be required to any given grade. The course syllabus is a good place to communicate this possibility.

Advantages

1. The system can reduce anxieties since the student knows what is expected.
2. It can reduce the role of personal judgment in grading.
3. It encourages self-set goals.

Disadvantages

1. There is a potential for overemphasis on quantity.
2. There can be difficulty in measuring diverse student activity.
3. Ambiguity may exist in qualitative distinctions between grades.

Self-Evaluation

A variety of formats can be used. The significant difference in this form of grading is that the source of the evaluation is the student. Instructors can use self-evaluation by students to determine part or all of the course grade.

Advantages

1. Self-evaluation can be a learning experience for the student.
2. Students are usually fair, objective, and demanding of themselves.
3. It encourages students to take responsibility.

Disadvantages

1. It can be taken less seriously as the novelty wears off.
2. It can be abused when students are not introspective.
3. It can be abused under extreme pressure for grades.

Grading Writing

The two most prominent ways of evaluating student writing are analytic and holistic scoring. The analytic approach to grading considers writing to be made up of various features, such as creativity, grammar, succinct expression of concepts, and punctuation, each of which is to be scored separately. An analytic writing score is made up of a sum of the separate scores and is often a weighted sum developed after multiplying each score by numbers representing the relative importance of the features the instructor wishes to emphasize. Holistic scores are arrived at by comparing individual student essays to model essays representing good, fair, and poor responses to the assignment. A third variation is a type of "global scoring," which assumes that writing is the sum of various features, but assigns the final score without the use of a scale. This method, which is most frequently used in casual approaches to grading writing, tends to result in less precise evaluation.

Analytic Scoring

Analytic scoring is the traditional approach to grading writing. Instructors who use analytic scoring view writing as a demonstration of many isolated skills that when graded separately and added together will come up with an appropriate evaluation of the piece. Many instructors choose to use analytic scoring because of its strengths, some of which are as follows:

1. It helps instructors keep the full range of writing features in mind as they score. An essay that is poorly punctuated may present a good analysis of a problem and/or strongly state a position. The punctuation may overwhelm the instructor to the degree that he or she fails to notice the strong elements of the essay and grades it too low.
2. It allows students to see areas in their own essays that need work when accompanied by written comments and a breakdown of the final score. Its diagnostic nature provides students with a road map for improvement.

Some weaknesses of analytic scoring are:

1. It is time consuming. Teachers who score analytically usually are required to make as many as 11 separate judgments about one piece of writing. Furthermore, not all students actually make their way through the analytic comments so painstakingly written on their papers nor will all be able to make profitable use of those comments on succeeding writing assignments.
2. Negative feedback can be pedagogically destructive. Teachers who combine analytic scoring with confrontational or unclear comments—especially about issues of grammar—may actually inhibit student growth.

The following guidelines may be useful to maximize the effectiveness of analytic scoring.

1. A written analytic scale, such as the one below, helps to define grading criteria clearly, and if shared with students can foster an understanding of what is expected and how it will be evaluated.
2. Criteria are weighted according to their relative importance. For instance, if the goal of an assignment is the assimilation of course material, then logic, ideas, arrangement, and resourcefulness would be rewarded more than grammar and mechanics.
3. Formative feedback in the form of marginal and end comments is most effective when the comments balance, challenge and support. Good writing is tough to do, and most students feel inadequate about their writing skills from having too little practice at it.
4. Instructors can downplay the possible confrontational effect of grading by being sensitive to such issues as using sarcasm in their comments, obliterating students' work with lines and the like.

Holistic Scoring

Writing experts have developed a special process for grading called holistic grading, which is especially useful in grading large numbers of essays. Student essays are usually graded by more than one evaluator. Using evaluative criteria developed from the learning objectives for a writing assignment, an instructor selects several student essays that exhibit high, average, or low achievement. These models then become the standards by which the instructor and one or more graders evaluate a group of essays. Each evaluator reads the student paper quickly and determines whether it is stronger or weaker than its closest equivalent among model essays.

As with analytic scoring, it is important that students are made aware of the method of evaluation and criteria in advance of their writing.

Holistic scoring has two advantages over other scoring methods:

1. Reliability. Holistic scoring is considered by some to be the most consistent and reliable method of scoring writing available to date.
2. Efficiency. Holistic scoring takes much less time to do. Each reader of a holistically scored essay reads the essay through quickly, matching its quality to that one of the model essays. With the model s firmly in mind, a holistic grader's first impressions of an essay are highly reliable.

Holistic scoring has the following disadvantages:

1. While the score given will be reliable, the student will not necessarily know the reason for his or her grade on the writing. Most instructors go back and make some kind of end comment on holistically scored essays to give the student some idea why the essay was better or worse than the model essays. Formative comments with regard to specific areas in need of improvement are not available to the student. Model essays can be given to the students for comparison.

2. Holistic grading can be impractical for individual instructors. While an individual instructor could go through a stack of papers looking for high, middle, and low models and grade the rest of the papers according to these models, the best situation for holistic grading occurs when two or more instructors work together. Holistic grading is ideal for large enrollment courses in which two or more T.A.s are responsible for the grading.

Other Suggestions for Grading Writing

1. Peers can provide useful suggestions on their classmates' papers before they turn in the final draft. To help students learn what to look for, make available examples of old essays (with the authors' names deleted) on which common problems have been noted.
2. More than one draft of a single paper may be useful for learning. Requiring students to re-submit encourages them to work through problems before submitting the final draft.
3. How instructors comment can be as important as what they comment on. Writing specialists prefer comments on content problems phrased as questions, e.g., rather than writing "confusing" in the margins, one might say, "I was with you until you began discussing 'active learning.' What do you mean 'active learning'? Why is that an important point here?" It is best not to use editors' shorthand when commenting on students' papers, e.g., "Awk" for Awkward. While convenient for the instructor, this type of comment lacks explanatory power for the student. If a passage is awkward or a word choice is incorrect, it is more informative to let the student know why.
4. Instructors need not feel as though they must find every error in a student paper. Writing specialists recommend putting a check mark in the margins next to a line containing a misspelling or other minor error. This places the burden back on the student to discover the error.
5. Not all writing assignments need to be graded. For example, instructors who assign journals often evaluate only a small percentage of the journal entries students have been assigned to write. The rest of the entries are simply counted to make sure that students are keeping up with their work.
6. Occasionally, an instructor will have students who need additional help with their writing. The Writing Center is one place to which you may refer such students.

Evaluating Students in Performance Settings

In settings such as laboratories, studios, or in the field, evaluation refers to information describing students' performance. It is a key step in the acquisition of skills, yet feedback is often omitted or handled casually. The importance of feedback in the acquisition of skills follows from the nature of the method. These skills are more easily demonstrated than described. Feedback occurs when students are offered insight into what they actually did, as well as the results of their actions. Insights gained through feedback highlight the difference between the intended result and the actual result, thereby providing motivation for change.

There are many explanations for the problems associated with evaluation in performance situations. The first and most obvious explanation is the failure to make firsthand observations of students' performances. Observations are the currency of feedback and without them, the process

becomes "feedback" in name only. Even if the data are at hand, other factors can confound the feedback process. Central to most concerns about feedback is that it will have effects beyond its intent. Both parties, the student and the teacher, make this mistake. The capacity of evaluation to elicit an emotional reaction is self-evident. Experiences with feedback that was handled poorly may inhibit giving or receiving feedback in the future. The teacher may be concerned that the student will be hurt by negative feedback, that it will damage the student-teacher relationship or the teacher's popularity, and that it will result in more harm than good. The student may view feedback as a statement about his or her personal worth or potential. Students may ostensibly want information about their performance but only insofar as it confirms their self-concept.

Such concerns and misconceptions often result in what is called in the field of personal management vanishing feedback. Anxious about the impact of information on the student, but committed nonetheless to the need for feedback, the well-intentioned teacher may talk around the problem or use such indirect statements as to muddy the message entirely. The student, fearing a negative evaluation, supports and reinforces the teacher's avoidance. The result is that despite the best of intentions, nothing of any real value gets transmitted or received. Even worse, concerns about the impact of feedback may lead to little or no feedback during the course, precisely when the students have the opportunity to improve their performance.

Following are some useful guidelines for evaluating performance:

1. The most effective evaluations are descriptive. The instructor should describe the behavior in clear terms rather than in interpretive terms. Attempts to report what is observed rather than making assumptions about students' intent are most valuable.
2. Specific descriptions are preferable to generalizations. Students need to know as precisely as possible exactly which parts of their performance need to be improved.
3. Evaluation is most effective when it is timely. It is best to provide feedback as soon as possible after the performance of the tasks. If the behavior is distant in time to the performance, the student is more likely to discount it as inaccurate.
4. Evaluation is most useful when the students and the instructor clearly understand precisely what skills or tasks are expected to be mastered and exactly how their performances will be evaluated.

Evaluation in performance settings is necessary and can be valuable. The process requires well-defined and readily visible goals. To this extent, the mastery approach referred to earlier seems particularly appropriate. Like giving feedback, receiving it properly is not always a simple passive act. It requires maturity, honesty, and a commitment to the goal of improving performance skills.

Some Common Questions about Grading

How can instructors protect themselves legally when grading?

Documenting decisions as carefully as possible and being consistent are helpful in avoiding legal complications. Keeping grade books secure and retaining them for some time after the course is over is also recommended by many departments. Instructors are advised to check with their departments for any regulations concerning the maintenance of these records. Some instructors also protect themselves by keeping lines of communication open and taking the opportunity to

prevent cheating when possible by making it hard to copy answers during exams, making it difficult to change corrections on returned papers, being careful to check off completed assignments, and so on.

How can instructors handle cheating when they think someone else wrote a student's paper?

If instructors do not have out-and-out proof of plagiarism or ghostwriting, they are quite limited. They might talk with the students in question and ask them how they decided on the topic or found the references to determine if the suspicions are warranted, but unless this provokes a confession, it is hard to take further action. Simply letting the student know that the instructor pays close attention, however, may encourage the submission of original work in the future. Some instructors attempt to avoid this situation with assignments that will not welcome cheating. (If the same term paper has been assigned in Psychology 100 for five years in a row, some "oldies" with new names are likely to surface. Also, if a topic is very broad—a paper on anything in history—it's easy to find something to submit that may not be original nor intended for that course.)

How can instructors grade on attitude, attendance, or participation?

In all cases, instructors should specify in advance if they will be considering these factors in the final grade. It is essential to make it clear which behaviors are being targeted and what the expectations of the instructor are. Attendance is straightforward to measure, but instructors should be prepared to define "excused" vs. "unexcused" absences. Instructors who choose to grade on attitude or effort will be pressed to justify decisions, so it might help to have specific criteria or tasks that will be related to the grade. Pop quizzes or assignments based on required readings may be used to motivate and document student preparation and attendance. On participation, some instructors keep a running record of contributions during discussion sections or ask a student to do so. In order to avoid putting shy or inarticulate students at a disadvantage, an instructor might ask for written comments or questions to be submitted, or offer to be available for personal talks at other times.

Concluding Thoughts

The grading system as well as the actual evaluation are closely tied to an instructor's own personal philosophy regarding teaching. Consistent with this, it may be useful, in advance, to consider factors that will influence instructors' evaluation of students. For example, some instructors make use of the threat or unannounced quizzes to motivate students, while others do not. Some instructors weigh content more heavily than style. It has been suggested that lower (or higher) evaluations should be used as a tool to motivate students. Other instructors may use tests diagnostically, administering them during the semester without grades and using the m to plan future class activities. Extra credit options are sometimes offered when requested by students. Some instructors negotiate with students about the method(s) of evaluation, while others do not. Class participation may be valued more highly in some classes than in others. These and other issues directly affect the instructor's evaluation of students' performance. As personal preference is so much a part of the grading and evaluating of students, a thoughtful examination of one's own personal philosophy concerning these issues will be very useful.

Useful Sources on Student Assessment

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Student Differences and Their Implications for Teaching

You can find a profile of MSU students on the main website, on the page called Facts. Important to teaching is some understanding of how these students are likely to differ in the ways in which they learn. Three broad categories of descriptive literature on students' ways of learning will be discussed here. They include cognitive development, cognitive style, and differences based on age, disability, or cultural background.

Cognitive Development

The most widely known work on the cognitive development of college students is *Forms of Intellectual and Ethical Development in the College Years* by William Perry (1970). Although Perry's study was completed some time ago and was based on a small sample of students from Harvard and Radcliffe, the scheme of development that he described has proven helpful to many in understanding students in many different settings.

Perry concludes that students move through stages of cognitive development, each of which is qualitatively different from and more complex than the previous stage. Through these stages, the ways in which they perceive, organize, and evaluate experience and events in their lives change. Perry describes nine stages, of which the first six pertain most directly to cognitive development.

He uses the term "dualistic" to describe the first three positions. The ways in which students at these stages differ are based on how they account for uncertainty:

Position 1: All information is either right or wrong. Uncertainty is not perceived.

Position 2: All information is either right or wrong, and where uncertainty seems to exist, it is really an error committed by a wrong authority.

Position 3: All information is either right or wrong, but uncertainty is acceptable in areas where experts do not know the answers yet. Someday the right answer will be discovered or found.

Students in the dualistic stage are often confused or hostile in a classroom setting in which multiple points of view are presented. They want "just the facts, please" and do not want to hear that there are conflicting opinions. They want the teacher to be strong, authoritative, and clear in the position that is taken. These students are apt to view their roles as passive recipients of a body of knowledge and will often resent being asked to play an active role in class. They regard the teacher as a person who already has the knowledge and may not feel that there is any value in contributing an opinion or listening to the opinions of their fellow students.

Students in positions 1 and 2 are able to learn (often by memorizing) basic facts and definitions of words and concepts, identify parts of a whole, begin to compare and contrast, and provide an explanation of why they answer as they do. In position 3, the student can compare and contrast and see multiple perspectives, parts, opinions, and evaluations. The student can do basic analytic tasks but needs to learn to use supportive evidence.

Perry uses the term "relativistic" to describe students in positions 4, 5, and 6. During this phase, the students' previous categories of right and wrong are transformed. Knowledge is now seen as uncertain or valid only within a context. The positions are differentiated by the following traits:

Position 4: The student begins to feel that most questions cannot be answered with absolute certainty and when uncertainty prevails, feels that all answers are of equal value.

Position 5: The sense of relativism enlarges and the student begins to form nonabsolute criteria for making judgments.

Position 6: The ability to make judgments increases and a personal stance develops.

Students in position 4 can compare and contrast, do abstract analysis, and do some synthesis. They can do both positive and negative critiques and use supportive arguments well. At this stage, the student is developing the capacity to relate learning in one context or class to other issues in other classes or to issues in real life.

In positions 5 and 6, the student can relate learning in one context to learning in another with some ease and can look for relationships in learning. The student can evaluate, conclude, support his or her own analysis and can synthesize various points of view. Finally, the student learns to modify and expand concepts of knowledge, and perhaps generates new ways of looking at a given question or formulates new questions.

Implications for Teaching

Administration of instruments designed to assess cognitive development in terms of Perry's scheme has revealed that, although students of a given age category vary in their cognitive levels, most college students in the traditional age range of 18 to 24 enter at the dualistic stage, and many progress toward the advanced relativistic stage as they go through college. Some enter at higher levels, and some will not progress, so one cannot assume homogeneity in a group of a given age. Nevertheless, a general guideline is that most seniors can perform cognitive tasks that most freshmen cannot, and instructional expectations should be based on this general guideline.

Some researchers use the notions of challenge and support to draw implications for teaching based on Perry's theory. They argue that students at a given level need to be stretched or challenged to continue to reach to higher levels but also need support to handle the challenge. They caution that one cannot expect students to skip over developmental stages; tasks must be at or only slightly above the student's level. Specific recommendations are summarized here:

Students in the dualistic stages. Teachers can challenge the students to move on to other levels by:

1. Employing content diversity in the curriculum by presenting two or three, but not more than three points of view.
2. Assigning different kinds of experiential learning activities and encountering content diversity through such activities as:

- structured discussions
 - structured group experiences
 - role playing
 - field trips with structured observation guides
3. Processing experiential encounters in pre-structured ways that emphasize differentiation and use the evidence to support views.
 4. Using a variety of media (print, AV) to convey information.
 5. Incorporating opportunities for the ideas of others to be heard in class.

Teachers can support the students as they work toward other levels by:

1. Responding to their need for structure by pre-structuring activities.
2. Using a syllabus that itemizes such details as specific assignments, policies, and due dates.
3. Using outlines of each class, textbook session, etc.
4. Preparing handouts that help students to fulfill course requirements (e.g., how to do a bibliography, laboratory report format).
5. Personalizing interaction with students by:
 - Providing opportunities for students to get to know each other and the instructor.
 - Using small group work in or out of class.
 - Using feedback techniques such as logs, journals, or response forms.
 - Responding to written work as concretely as possible.

Students in the relativistic stages. Teachers can challenge the students to move to higher levels by:

1. Providing them with opportunities to choose positions and defend their choices.
2. Asking them to narrow choices and weigh pros and cons of alternative arguments or choices.
3. Drawing upon course material that stimulated thinking about personal philosophy and life choices.
4. Setting learning tasks that call for students to analyze, synthesize, and evaluate from personal perspectives and then progressively more abstract or experiential perspectives and call for students to apply learning from one context to problems in a different context.
5. Posing activities that ask students to generate new questions or evaluate assumptions inherent in how points of view are constructed.

Teachers can support the students as they move to higher levels by:

1. Providing choices of assignments and projects and minimizing the structure and guidance provided.
2. Allowing for more flexibility and creativity in formats of written work.
3. Continuing personalization through group work, opportunities for participation, peer teaching and learning.

Women's Development

Belenky and Associates (1987), aware that the sample for Perry's research was largely male, undertook research on female cognitive development and found different patterns in their sample of women. They described an initial level of silence in which women feel powerless and intimidated by male authority and forms of argumentation. Following this are four more levels:

1. Received knowledge. Women at this level are listening to others around them and relying on the voices of authority. They see things dualistically as did the participants in this stage of Perry's study, but identify less with the authority figures. They regard the multiple perspectives they read and hear as increasingly confusing and hard to reconcile.
2. Subjective knowledge. Dissatisfied with received knowledge, they turn to their inner voices and trust their own feelings and thoughts at this level. They believe that all opinions are equally valid and that first-hand experience is the only valid route to knowing.
3. Procedural knowledge. Once again, women listen to outside voices, but this time, they are listening about how to think rather than what to think. They are interested and aware of multiple perspectives. Research suggests distinctions between two kinds of procedural knowledge: separate knowing that relies on analysis, dispassion, and argument; and connected knowing that is holistic in nature, joining emotion with reason and seeking understanding and interconnections among perspectives. Even connected knowers, however, experience a sense of alienation at this stage since their knowledge is so directed toward the other.
4. Constructed knowledge. At this level, women are able to integrate their own voices with those of others. They are active builders of a knowledge base and see that "All knowledge is constructed and the knower is an intimate part of the known" (Belenky et al., p. 137).

Although Belenky and associates make the point that given types of cognitive development are not exclusively male or female, they do note that the above pattern is found more in women than in men.

Other research describes stages that have similarities with those found by Belenky. It describes four levels of knowing (absolute, transitional, independent, and contextual). Within each of these levels, two contrasting approaches are distinguished which are gender related. These are the interpersonal approach, found more commonly in women; and the impersonal approach, more characteristic of men. Interpersonal learners are more concerned than impersonal learners with sharing ideas (rather than debating them), with seeking rapport with the teacher (rather than being challenged by the teacher), with expecting to be evaluated as an individual (rather than receiving standard treatment), and using personal judgment (rather than logic and research) to resolve uncertainty. Although men and women pass through similar stages at similar rates in developing cognitive complexity, their approaches toward knowledge tend to be different.

The implications for teaching of the research on cognition and gender include the importance of recognizing that women may often feel overwhelmed and silenced by a discourse style that is not comfortable to them, that they may want to trust personal judgment, instincts, and emotions as valid contributions to arriving at a position; and that they may withdraw from argumentation and forced analysis as hostile or unproductive forms of activity. Instructors can help women to

progress in their cognitive growth by providing a supportive and nurturing environment, being especially sensitive to "giving women their voice" through moderating discussion to ensure equal levels of participation and encouragement and providing opportunities for personal forms of expression in papers and projects.

Cognitive Styles

Another way of describing differences in students is based on the idea that people have different ways of learning. Research in this area has mushroomed in the past several years, producing descriptions of styles based on a variety of organizing ideas. A few of the dominant schemes are described here.

Field Independence and Field Dependence

Based on studies on perception, Witkin and Moore (1975) describe a central differentiating characteristic of learners based on the way in which they handle information in context. They called learners who perceive in holistic fashion field dependent learners. These individuals rely on external stimuli in approaching a task and have a much more difficult time separating the individual parts within a whole. These students tend to be more social in their interests and like teachers to structure classroom goals for them. They prefer group work and student discussion in class.

Witkin and Moore describe field independent students as those who try to analyze things into component parts and like to work independently. Field independent students are able to set their own learning goals and prefer the freedom to participate in setting their assignments. They like to work with abstract ideas and prefer to work with a minimum of structure and guidance.

Kolb's Learning Styles

David Kolb (1981) posits that four main processes are used in learning:

1. Concrete experience: learning through direct involvement in a new experience.
2. Reflective observation: learning through watching others or through thinking about our own experiences or those of others.
3. Abstract conceptualization: learning by creating concepts and theories to describe and explain our observations.
4. Active experimentation: learning by using the theories and concepts we have derived to solve problems and make decisions.

He states that most people apply these four processes in cyclical fashion as they learn, but that each person engages in some activities more than others. Depending on these preferences, he describes four learning styles:

1. Convergers rely most on abstract conceptualization and active experimenting. They like to find specific, concrete answers and move quickly to solution. They are relatively unemotional and prefer dealing with things rather than with people. Convergers often

specialize in the physical sciences or engineering. They prefer learning tasks that have specific answers.

2. Assimilators rely most on abstract conceptualization and reflective observation. They like to integrate ideas and are more interested in theoretical concerns than in applications. Assimilators tend to gravitate toward math and the physical sciences and like research and planning. They prefer learning tasks that call for them to integrate material.
3. Divergers rely on concrete experience and reflective observation. They like to generate many ideas and enjoy working with people. They often are attracted to such fields as counseling and consulting. Divergers enjoy class discussion and working in groups.
4. Accommodators rely on concrete experience and active experimentation. They take risks, are action oriented, like new experiences, and are very adaptable in new situations. They prefer a hands-on approach and often are attracted to technical or business fields, such as marketing and sales.

Learning Modalities

Several researchers have focused on the extent to which sensory receptors influence learning. In general, they describe the following different types of learners:

1. Auditory learners prefer to learn by listening. Lecturing is the teaching approach that works best for them.
2. Visual learners prefer print material. They learn best by reading or responding to visual cues, such as the blackboard or overhead transparencies.
3. Tactile learners like to manipulate objects. Laboratory or hands-on methods of learning are most appropriate for them.
4. Kinesthetic, or whole body learners, like to learn through experiential activities. They prefer simulations, exploratory activities, and problem solving.

As with all of the literature on learning styles, however, the emphasis with sensory modality preferences is not on trying only to match learning and teaching styles, but on extending the strengths of learners and expanding their range of modalities.

Cognitive Styles and Culture

Although learning style is not directly related to race and gender, women, African American, Native American, and Hispanic students often have a learning style referred to as field dependent or field sensitive. They do best working in groups on verbal tasks. Research further indicates that they learn more easily those materials that have humor, social content, and are characterized by the use of imagination. In learning situations, they are most sensitive to the opinions of others. This particular learning style often conflicts with the traditional school environment, which tends to favor individual and competitive learning processes. Many European Americans and Asian American students, however, are field independent learners. Therefore, they tend to perform better on analytical tasks, learn material that is inanimate and impersonal more readily, and not be greatly affected by the opinion of others as they perform.

Cognitive Styles and Teaching Strategies

The differences in cognitive learning styles have distinct implications for preferences in student instruction and teaching strategies. An initial approach for instructors might be to develop a sense of the expectations that students and instructors use the classroom. Such interactions guide the more formal dimensions of the teaching-learning dyad. One example of the expectations that two different types of students exhibit is outlined on the accompanying chart.

Teaching in a diverse classroom means that there will be many different learning styles. Effective teaching cannot be limited to the delivery of information, but needs to be based on a model of minds at work. The generative process of learning is most effective when instructors (a) affirm the presence and validity of diverse learning styles and (b) maximize the climate or conditions for learning in the classroom. While instructors are alerted to differences when they identify learning styles with particular groups, they should still use a full range of instructional strategies.

Differences Based on Age, Disability, Sex, or Cultural Backgrounds

Researchers who study the learning styles of diverse populations—students not traditionally a part of the college enrollment—have made observations about the particular ways in which these students can learn most effectively. These archetypes, developed to aid learning of nontraditional students, can help instructors be more aware of the needs of their students. In order to avoid assuming that all members of a given group display characteristics that have been associated with the group as a whole, however, it is important for the instructor to consider carefully whether general characteristics associated with a group of learners are descriptive of a particular student in the course. A summary of some of the characteristics of different learners is included here.

Older Students

1. Many older students lack confidence and feel uncomfortable in the college environment that is still predominantly populated by young adults. Instructors can help them by offering positive feedback as often as they can, by avoiding comparing students, and by avoiding putting adult learners "on the spot" by drawing attention to their age or directly calling on them to contribute when they do not volunteer.
2. Adult learners, even more than younger students, feel the need for learning to be relevant to their life experience. They are more likely than younger students to question the importance of a given assignment or body of information (although they may not make their reservations known, since they lack confidence). They are also more eager to make contributions based on their personal experience and to use these experiences as the basis for argument in papers and other assignments. Instructors can enlist the support and enthusiasm of older learners, explaining the relevance of assignments and class activities to the course whenever possible. They can also provide opportunities for older students to draw on their own experiences and incorporate new learning through the lenses that past experience provides, helping students learn to derive abstract ideas from these experiences in the process.

3. Personal responsibilities of adult learners are often more complicated than those of younger learners (but not always). They may have a child in the hospital, a major report due at the office, or a leaking roof to fix at the same time a term paper is due. Often, they are making large sacrifices to attend college and are spreading their effort over many different life tasks. Instructors can try to understand their situations and exercise whatever flexibility they can.
4. Especially with much older learners, physical limitations, such as poor vision, hearing loss, or diminished memory, can impair learning. Time limits and reliance on a single mode of teaching, such as lecture, constrain opportunities for these older students. Instructors can vary the stimuli (using visual as well as auditory approaches) and make whatever allowances for time and recall that they judge possible and fair in the situation.

Students with Disabilities

1. Students who are physically challenged may be relying on special transportation and may need special considerations in order to attend. Instructors who are flexible about time and make sure that physical arrangements accommodate these students help them to participate in class.
2. Students with physical and learning disabilities may require such considerations as extra time to take a test, a reader to read the text or test to them, or special equipment to compose written work. The Services for Students with Disabilities office provides these services and can advise instructors on what is reasonable to allow and how to refer students to appropriate support services. Often, however, students will be reluctant to ask for special arrangements. Instructors can help by notifying the entire class publicly or stating in the syllabus that any student who has need for test-taking or note-taking accommodation should feel free to discuss the matter with them.
3. Students with learning disabilities sometimes need extra encouragement to sustain their participation, but often do not want to be singled out for special attention. Instructors who try to be sensitive to maintaining a good balance between helping these students and not providing undue attention to the disability will help further their learning.
4. As with students with different learning styles, it helps students with learning disabilities and some physical disabilities to have information presented in a variety of ways, such as visually and orally. Supplementary sessions outside of class time can be scheduled for this purpose.

Women Students

1. Although women have been a part of the college scene for many years now, classroom practices that have arisen through a tradition of male-dominated instructional settings are often still in use and detract from learning opportunities for women. These practices are described extensively in Hall and Sandler (1982) and include use of sexist language and jokes, failure to recognize women during discussion or to employ eye contact with women in discussion situations, holding lower performance expectations for women than men, and routine assignment of dominant roles such as team leader to men rather than women.
2. The world view, epistemology, and curriculum content of most university instruction has been rooted in the male western tradition. Instructors can enhance learning opportunities for women as well as men by trying to incorporate in their teaching the contributions of women and other cultures and recognizing the value of multiple ways of knowing. They can see

knowledge as constructed, rather than transferred, and learn to appreciate alternate ways of knowing, such as emotions, insight, and intuition.

Students of Different Cultural Backgrounds

1. Stereotypes about different cultural backgrounds abound. Assuming that every Asian American student is good in math or that every African American student is an athlete or from underprivileged backgrounds leads to faulty expectations that are communicated to students in subtle ways, often only subconsciously. It is important for instructors to view students from other cultural backgrounds as individuals who may or may not have characteristics of the dominant culture before forming expectations.
2. Many students whose family traditions are rooted in the culture of such places as Africa, Puerto Rico, Mexico, and pre-European America exhibit learning styles that emphasize group cooperation, holistic thinking, a concrete rather than abstract orientation, a valuing of personal knowledge, oral over written tradition, and reliance on imagery and expressiveness to provide an affective component to learning. Instructors who recognize the strengths of these cultural orientations and provide opportunities for students to draw upon them not only furthers the learning of the students but enrich the learning opportunities for all students, some of whom may share these styles and others of whom can profit through expanding their stylistic repertoires.
3. Language, either of another country or an American dialect, is often a sensitive issue with students from other cultural backgrounds. Students with language differences need to know, first of all, that their language is respected. It is important to remember that all language is culturally bound. The rules of a given language are determined by usefulness; therefore, it is problematic to impose standards from one context on a language that is part of another, or to denigrate language systems that are not mainstream. Instructors who focus on task or content when this can be separated from language help students to retain self-confidence and cultural pride in a different environment. Using visuals, synonyms, and examples when lecturing or in an examination of questions helps those with different language backgrounds to understand what is being communicated. Instructors should take the time to get students' names right, especially those in a language other than English. It is important to be sensitive to names of groups; for example, "African American" and "people of color" and "students with disabilities" are currently favored, at least in certain geographic locations. "Minorities" is objectionable to many who know that they either are or soon will be in the majority in their state or country. The safest stance is to ask the student how he or she prefers to be addressed before assuming the use of a particular term.
4. Teaching style expectations are often different across cultural backgrounds. Students from Asian countries may regard asking questions or maintaining prolonged eye contact as improper behavior toward a teacher. Many African American students prefer an informal conversational style with sustained eye contact and use of humor by their teachers. While it is impossible for an instructor to accommodate all teaching style preferences and still be true to a personal style, it is important to work to accommodate different frames of reference.
5. Students bring to the classroom a knowledge of the achievements of their cultures and the traditions of their heritage. Instructors who incorporate these achievements in their curricula not only build on their students' sense of pride and self-esteem but also enrich the scope of knowledge available to all students in the course. It is important, however, for the instructor

to avoid assuming that a student with a given cultural background is able or willing to serve as the representative of that culture when classroom discussions occur. Calling on an African American student to talk about slavery or a Native American to talk about life on an Indian reservation puts the student in a sensitive position, even if the motivation is student involvement.

Interstudent Conflict in Diverse Environments

How should instructors respond to interstudent conflict? Here are several suggestions:

1. Deal with conflict immediately when it appears in class. The goal is to educate and change the behavior of all students. More often this will take the form of talking to one or more students outside of class, but occasionally an obvious instance will emerge in class itself. Setting the stage early in the course with an assigned reading on multicultural sensitivity makes the later discussions easier and more natural.
2. Be willing to accept high emotions and conflict as a natural and necessary accompaniment to student-centered learning.
3. Be clear about the limits of your role: you are needed and can be effective as a teacher/mentor more than as a friend.

How Should Instructor Respond to Student Differences?

The following guidelines should help summarize the advice on individual differences. While working in a group setting makes it impossible for instructors to respond to each unique need, they can be sensitive to individual differences by:

1. Providing options for participation, for assignments, for class activities.
2. Varying the ways in which instruction is provided, trying to supplement lectures with opportunities for discussion, with audio-visual aids, with hands-on or real world experiences when possible.
3. Instructors can try to extend the learning styles of all their students as well as respond to them. Students from an oral tradition need to have more writing experiences; students who view knowledge from a dualistic perspective need to be helped to understand that things are more complex; students who rely on concrete experience need to develop greater facility with abstract thinking. It is important, however, that efforts to extend student learning styles and cognitive levels build incrementally on given levels and that instructors not expect major leaps or changes in direction.
4. Respecting individual differences, avoiding thinking about students in terms of stereotypes, and keeping channels of communication open are invaluable approaches toward dealing with differences. Instructors can be vigilant in avoiding sexist or racist behaviors and humor in their own actions and in correcting these behaviors if they are displayed by students.

Ways for Instructors to Determine What Approach Is Appropriate

Instructors can:

1. Talk to others who have previously taught a course about what can be reasonably expected of the students in that course.
2. Use the first class session to obtain information, either on cards or orally, on the backgrounds of the students (major, hometown, age, etc.), their prior preparation for the course (previous related coursework, previous degree or work experiences in the area, etc.), expectations for the course (personal goals, career goals, preferred learning activities or teacher styles).
3. Administer a pretest at the beginning of the course or unit to determine students' entry levels.
4. Watch students' facial expressions and other nonverbal signs of understanding, confusion, or emotional response in class.
5. Encourage students to speak with them outside of class or routinely arrive early and talk with students before class. Instructors can make a point of speaking with a wide range of students not only the high achievers.
6. Provide early feedback through a test or paper that will count only marginally, if at all, toward the final grade.
7. Administer a learning style inventory to assess differences in the students or ask students to provide a self-report on the ways in which they learn best.
8. Provide frequent opportunities for students to comment on the instruction. One way is the five-minute paper, an exercise that involves asking students to take the last five minutes of class to comment on one main concept that they learned and questions they would like addressed in the next class, or on their assessment of how well the course is going and their suggestions for change.
9. Obtain student evaluations of instruction at midterm and at the end of the term to provide direction for the remainder of the term or for the next time the course is taught.
10. Make use of resources, seminars, and brown bag lunches that are available through the academic departments of your school or college.

Useful Sources on Student Differences

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The Teaching Portfolio

(from Teresa A. Sullivan, *Teaching Pedagogy to Teaching Assistants*. 3rd ed. Austin: University of Texas Center for Teaching Effectiveness, 1992.)

The teaching portfolio is one solution to the problem of how to evaluate a professor, assistant instructor, or teaching assistant. The teaching portfolio is assembled by instructors and contains examples of their best work. Especially for a new teacher, it is useful to have materials available that indicate careful thought and planning for instructional use.

The objective of the portfolio is to present different types of information about the teacher, but because the portfolio contents are not completely specified, the portfolio is highly personal. For example, an instructor who develops original materials for courses would want to include samples of those materials. A professor who is particularly noted for editorial skills with student work might want to include examples of graded papers. A teaching assistant whose major responsibility is supervision of a laboratory might include copies of graded laboratory reports. In the sections below, some materials which might be useful in assembling a teaching portfolio are described and explained.

The Purpose of the Teaching Portfolio for Teaching Assistants

The teaching portfolio has two basic purposes. First, it is used for evaluating the teaching competence of an instructor. This use of the portfolio is retrospective; that is, it looks back on the progress that a teacher has already made, and may point to areas that need further development. Compiling the portfolio and keeping it up-to-date is often useful for the instructor's own self-evaluation and development. Moreover, many schools now use portfolios in hiring, tenure, and promotion reviews. Departments might want to review teaching portfolios in decisions about retaining teaching assistants or assistant instructors. As the discussion below will suggest, the portfolio provides a much more detailed evaluation of teaching than the use of course-instructor surveys alone.

The other use of the teaching portfolio is prospective: it can present information on courses than an instructor might teach in the future. Used in this way, the portfolio illustrates a candidate's ability to conceptualize and plan a course, to think through pedagogically problems of the course, and to prepare appropriate materials. This type of teaching portfolio can be useful for the teaching assistant preparing for an assistant professorship, or for the graduate student preparing for the academic labor market.

The Components of the Portfolio

What will be included in the portfolio depends in part on whether it will be a retrospective portfolio, a prospective portfolio, or a combination of the two. Moreover, because the portfolio is a creative work designed to showcase the art of teaching, portfolios will be highly individualistic

and personalized. What is listed here are some examples of materials that might be included in a portfolio.

Materials on the range of the teaching repertoire

Readers of the portfolio need to understand the range of courses that the teacher has taught or is prepared to teach. This might be a simple list of the institutions at which the teacher has taught, with a listing of the courses taught. For students who have not yet taught, there should be a listing of the courses the student could reasonably prepare within the first year or two of full-time employment. The portfolio is one method for showing how ready a new Ph.D. might be to undertake multiple preparations in the first year of teaching.

It is useful to specify the levels of the courses (remedial, lower division, upper division, graduate) and also the format if that is relevant (laboratory course, seminar, individual tutoring, etc.). Graduate students might want to indicate, as well, the range of the teaching responsibilities they undertook as teaching assistants. Did they lead a discussion session? Design and grade exams? Conduct language drills? Rehearse a choir? Set up laboratory experiments? Graduate students should be reminded that some interactions they have are not defined as teaching, such as meeting with students in office hours.

Job experience that is indirectly relevant might also be included; tutoring, volunteering in literacy programs, teaching informal classes, planning and teaching for a Sunday School or day care center. Graduate students should be cautious, however, that the relevance of these tasks may need to be highlighted. For example, "Although my junior high Sunday School students are not college age, from working with them I learned the importance of varying my teaching technique to get my point across."

Information on specific courses that have been or could be taught

Information on specific courses gives the reader an idea of how the teacher organizes a course, presents information to students, and evaluates students.

Examples of information that might be included for a specific course are: the syllabus, reading lists, examples of handouts or transparencies, examples of examinations or sample questions, lecture outlines or lesson plans. It is also useful to include learning objectives and the methods of grading or evaluation.

For a course that has already been taught, instructors might also provide information on the composition of the course. How many students were enrolled? How many were majors? Were there students who had particular problems, such as math anxiety, difficulties with the English language, or no previous exposure to computers? Such information can also help provide a context for understanding student evaluations (see below).

Specific examples of student work and interactions with students

The best and worst essay in an examination might be included to show the range of student abilities with which the instructor had to work. Examples of graded work are often included in portfolios to show the characteristic type of feedback given to students. In some cases, successive drafts of a paper or essay might be included. It is best to receive students' permission

to included these materials. Alternatively, student materials may be included with the students' names removed.

Depending on the course, it might be appropriate to provide before and after samples of student sketches, audiotapes of students' music performances, photographs of student projects, or lists of term paper projects.

Information on outcomes

Surveys of student opinion and evaluation are a valuable first step to include in portfolios to measure outcomes, but they must be used with care. They surveys are affected by selectivity bias; some students simply never fill them out, and unless these students' views are exactly at the mean for the course, the omission of their opinions will skew the evaluation either up or down.

As a rule, the survey instruments are returned anonymously. Survey data may be supplemented with other student reactions, such as unsolicited student letters, student nominations of the instructor for teaching awards, or comments from the instructor's selected panel of student reactors. These materials may be included anonymously, or with the signature if this is acceptable to the student author.

Teaching is inevitably a process that is best observed in the classroom. Some instructors now include a videotape of a class session as part of their portfolio. The process may also be described in detail by trained observers. Some departments have regular visitations or peer review evaluations. If there have been peer evaluators, their comments are often valuable additions to the portfolio. This is especially true if the material is technical or complex, and the students might not be competent to judge the adequacy, currency, or correctness of the material presented in class. If it is consistent with department policy, these evaluations may be included in the portfolio. If the evaluations are signed, the permission of the evaluator should be sought first.

Other outcomes could be included with materials such as item analyses of the tests, the final grade distribution, the "curve" used in the course, grade inflation index measures, and exit survey data. Only the instructor's imagination limits the material that can be included. One instructor, for example, wrote to students a year after graduation to ask if a certain course had been useful to their current jobs.

It is useful to include any evidence that the class has had an impact beyond the classroom. Anecdotal evidence might include newspaper articles about the course, teaching award nominations or presentations, or favorable mention of the course in disciplinary newsletters or publications. Sometimes it is possible to document the broader impact of materials one has developed for the classroom. Textbook writers, for example, could include a list of the schools at which their book has been adopted. Techniques that have been written up in a teaching newsletter, letters from colleagues who have adopted one's teaching ideas, or invitations to speak to professional audiences might be noted in the portfolio as signs of successful outcomes.

Efforts at teaching improvement

It is useful for teaching assistants to document efforts to improve their effectiveness in the classroom. These efforts might include taking workshops on new developments in the course

subject matter, attending workshops on pedagogy, consultations with others to improve teaching, or use of the programs available to you through the teaching improvement centers in your school or college. Efforts to improve teaching should not be too narrowly defined. Learning a new computer technique that might have classroom applications can be an investment in one's teaching. So can participating in race or gender sensitivity workshops, especially with the diverse student body characteristic of our University .

Teachers should be candid about identifying their own objectives for improving their teaching. One or two issues on which they are working should be sufficient, along with a plan for meeting these objectives. It is unrealistic to try to work simultaneously on ten or twelve areas of teaching improvement.

Other impacts on the undergraduate program

Instructors can also have an impact on the teaching environment through their other contributions to a department's undergraduate program. It is worth mentioning efforts at curriculum development, course redesign, academic advising of undergraduates, and the sponsorship of undergraduate clubs or activities.

Broader impacts on teaching

You may also have activities to report in improving teaching in the broader academic community, such as membership and/or participation in professional associations, state or regional meetings, local school districts, or at conferences.

Presentation of the Teaching Portfolio

The teaching portfolio may be presented in a loose-leaf binder, with tabs to mark its various sections. Portfolios that are accompanied by additional materials (e.g., videotapes, audio tapes, textbooks, etc.) might be assembled in a small box. In the latter case, there should always be a checklist of contents so that parts of the portfolio are not lost.

Students should be encouraged to return to their portfolios and to update them periodically, at least once a year. Experienced T.A.s and professors will eventually identify "best examples" of their work and periodically replace outdated work.

Teachers and students should always be informed of the purposes for which a portfolio is being requested. If it is being used for evaluation, the teacher should be told which group of individuals will have access to it. Appropriate measures should be taken to be certain that no materials are removed from the portfolio, nor any new materials placed in it. If constructing a portfolio is assigned as a classroom project, the instructor should be explicit about who will have access to the portfolio. It can be very useful for the students to see each other's work, but sharing the portfolio with other faculty without the knowledge of the students should be avoided, especially if the faculty will later be evaluating the students' performance for appointment or reappointment to the instructional staff.

Useful Sources on The Teaching Portfolio

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