Reaching All Students
A Resource for Teaching in Science, Technology, Engineering & Mathematics

Second Edition

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Reaching All Students is a resource developed by the Diversity Team of the Center for the Integration of Research, Teaching, and Learning (CIRTL), a NSF-funded multi-institutional project of the University of Wisconsin–Madison, Michigan State University, The Pennsylvania State University, the University of Colorado at Boulder, Howard University, Texas A&M University, and Vanderbilt University. During the Diversity Institute in 2004-2005, diversity scholars recruited from across the nation collaborated with the CIRTL Diversity Team to explore inclusive teaching in post-secondary science, technology, engineering, and mathematics. Resources currently available include:

Reaching All Students: A Resource for Teaching in Science, Technology, Engineering & Mathematics
Case Studies in Inclusive Teaching in Science, Technology, Engineering and Mathematics
Literature Review
Web Links Directory
Content Matters: An Inclusive Syllabi Project

For more information on these and other resources, visit http://cirtl.net/diversityresources/

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The First Day of Class

When the Class Meets You

The first day of class is when you introduce yourself to your students. Clearly spell out the relationship you want to have with students (e.g., see me during office hours and by appointment; see me any time; here's my e-mail address) and let your students know how you want to be addressed. You need to accomplish a number of administrative tasks while trying to create an open, welcoming classroom environment. Focus on setting course expectations and standards. Let students know you have high expectations for them, but that you are committed to helping them reach those goals.

When to Arrive

The timing of your arrival on the first day of class will help set the tone for the semester. If you arrive early, well before class begins, you can get to know students and they can get to know you. If you want a more formal setting, you can arrive just before you are about to begin class, without leaving time for informal discussion.

What to Post on the Board

It is usually a good idea to arrive at least a few moments before class begins to give yourself time to write the title of the course, the section number, your name, your office phone number, and the instructor's and/or teaching assistant's name on the board before students arrive. Then they will know whether or not they are in the right place. You could also post your office hours if you have determined them, but some instructors like to wait until they have experienced a week of their own academic schedules so they will not post what turns out to be an impossible time slot for either themselves or their students.

Introducing Yourself

Let students know who you are by telling them why you chose the field you are in and why you find it exciting. Tell them about relevant experiences or background that qualifies you to teach this course. Try to make yourself more approachable by giving them more of your background — telling them where you are from, where you did your undergraduate work, and
other interests you may have. Furthermore, if you are making choices about the way the class is taught, you may want to provide them with a rationale for the format of the course and why you chose the teaching methods you have. This lets students know that you have thought about your teaching and how it can enhance their learning. If you have a philosophy of teaching, share that with the students. For example, tell them that —Learning is about taking ideas and turning them into ideas that make sense to you;‖ that there are no stupid questions; and that learning should be interesting, but also requires struggle.

**When You Meet the Class**

**Getting to Know Your Students**

Learning students’ names can go a long way in letting students know that you care about them as people. Although it may be difficult at first, it is well worth the effort in the long run, because it lets students know you value them as individuals. In some very large lectures, it may be impossible to learn every student’s name, but even using some student names in class can still be helpful.

Sometimes instructors choose to engage their entire class in an introductory activity, not only to learn students’ names, but also to have students learn more about each other. Such activities can help relieve both you and the students of first-day tensions, and can also promote a comfortable atmosphere. This is particularly important if you want students to be actively involved in discussions and in asking or answering questions. It is critical to build a sense of community in the classroom and address student concerns.

These activities often involve having students get into pairs and giving them one or two questions to ask each other. Before they start the activity, tell them that they will be expected to introduce their —partners‖ to the entire class after having interviewed them with the questions you have assigned. Give the students about five minutes to answer these questions (two and a half minutes per partner) and then have them make the introductions to the class. Examples of such questions follow:

1. What are your name, hometown, and major field of interest?
2. Tell me something unique about yourself.
3. If you could be any person in the world other than yourself (living or not, real or fictional), who would it be, and why?
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⇒ Use photographs. Group three or four students in a single Polaroid shot. The act of posing for a picture breaks the ice. You can have students write their names underneath their pictures.

⇒ Arrive for class as early as you can, and use this time to sit and talk to the students who are waiting for you to begin.

⇒ Use name cards. For seminar classes, place name cards in front of each student. For lab courses, post students’ names above their work stations.

⇒ Use a seating chart. Ask students to sit in the same general area for the first few weeks, and block general locations within the room on a piece of paper. Write the names of students inside the appropriate blocks. During the first class meeting, ask students to write answers to some simple questions about their backgrounds, interests, and motivations on index cards. Collect the cards and use them as memory aids as roll is called or as papers and quizzes are returned.

⇒ Find out about students’ experiences in other science courses, with the particular subject matter in this course, and in prerequisite courses.

⇒ Arrange for regular informal lunches with different small groups of students.

⇒ Early in the course, write personalized comments on assignments returned; invite students to come by to discuss their progress.

⇒ Require students to pick up their exams in person to discuss the outcome briefly.

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Perceived Diversity

When we speak of diversity in the classroom, we usually focus on the diversity of the students in the room. We often forget that the teacher also brings a range of diversity issues to the classroom. Every teacher brings his or her physical appearance and culture into the room at the same time as the students do. How you look, how you speak, how you behave, and the extent to which these differ from the physical, cultural and intellectual backgrounds of your students, will have a profound effect on the interactions in your classroom. Thus you need to be aware of possible reactions among the students to your race, gender, age, ethnicity, physical attributes, beliefs and abilities. Preparing for such reactions will involve not only knowing as much as you can about your students, but also turning the mirror toward yourself.

You might identify your own attitudes toward diversity by remembering certain pivotal moments in your life. Ask yourself the following questions:
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1. Recall the incident in which you first became aware of differences. What was your reaction? Were you the focus of attention, or were others? How did that affect how you reacted to the situation?

2. What are the messages that you learned about various minorities or majorities when you were a child? At home? In school? Have your views changed considerably since then? Why or why not?

3. Recall an experience in which your own difference put you in an uncomfortable position vis-à-vis the people directly around you. What was that difference? How did it affect you?

4. How do your memories of differences affect you today? How do they (or might they) affect your teaching?

Students who perceive the teacher as belonging to a particular racial or ethnic group and who then draw initial conclusions from that classification can affect the class atmosphere either negatively or positively from the first day. One assistant professor at the University of North Carolina faced with perceived diversity issues in the classroom puts it this way:

—An issue that concerns me greatly has to do with issues of gender and race/ethnicity in student-teacher interaction. Although some of my students have shown respect (and even admiration) toward me as a professor and as a person, other students have challenged my authority and have openly questioned my knowledge. I wonder to what extent the combination of my gender and ethnicity colors students’ perception of my teaching.

It is probably impossible to determine exactly to what extent perceptions of race, gender and ethnicity motivate such challenges to the authority of the professor. Clearly, however, such perceptions do color people’s everyday assumptions.

The above quotation shows that some students can see a professor’s gender and ethnic diversity as advantages. If a student does repeatedly challenge the teacher in a manner the teacher deems inappropriate, however, it may be wise for the teacher to ask the student privately to come to an office hour. There, they can discuss the possible reasons behind the student’s behavior in a non-threatening and less-public place. Discussing the problem privately may prevent the possibility of a single student-teacher relationship affecting the tenor of the entire class. It will also give the student the chance to explain his or her position, thus giving the student a hearing, which may in itself defuse the situation. Showing the student that you care about his or her progress, while maintaining your professional demeanor, will make the point that you both have a professional teacher/student relationship to uphold. Listening to the student and being willing to advise him or her in a friendly manner will emphasize that relationship.

The best way to minimize the likelihood that your own perceived diversity will affect student behavior is to establish a safe environment in which the class can discuss both
your diversity and your students’ diversity. Such a safe atmosphere establishes the difference between a highly successful class and one where both teacher and students fear one another, experiencing discomfort when it comes to discussing the —real issues. This fear can be the fear of being labeled as an outsider, or the fear of offending someone and making him or her feel unwanted in the group. Either way, fear is not a good basis on which to start any discussion.

The issue of diversity will be an important point of interest to the students you meet in your classrooms because the average 18-22 year-old student is in a stage of development where cultural identity and value orientation are being established. For the first time, students find themselves in an environment where they must form opinions on these topics without worrying about what their elders will say. For many of them, the university is the first place where they meet a wide range of people from various groups and where they leave their habitual groups behind. The university environment gives them a chance to explore these issues, and most students react well when they have the chance to reevaluate the opinions with which they grew up, and to develop independently.

**Age**

TAs who go directly into graduate school and immediately start teaching are less likely to have problems relating to their students’ culture than older teachers do. Younger TAs are close enough in age to have been exposed to similar television shows, music, political events and so forth. However, many young TAs fear that they will fail to command attention and respect because they are too close to their students’ age. This fear usually subsides rather quickly when it becomes clear that most students respect their teachers, young or old, as long as the teachers come to class well-prepared. TAs are considerably more knowledgeable in their field than most undergraduates, and will have little trouble commanding student respect if they prepare well for class and behave respectfully toward students.

Many professors and TAs who are four or more years older than their students, however, often experience a mini-generation gap. They no longer share the same tastes in music or in clothing, and they watch different (and often fewer) television shows. Often, older teachers have considerably different views on politics and current culture than their students simply because they grew up at a different time. Such differences are not negligible. One runs the risk of seeming so old-fashioned and out-of-touch that the topic one is presenting seems —purely academic—to the students. Such attitudes arise more often in courses that meet general undergraduate requirements, since students have not chosen those courses out of personal interest in the topic.
You can more easily engage your students if you can speak to them about their culture and put the major topics of your field into the context of their lives. Here you might take the opportunity to become a student of your students by educating yourself about their experience of the world. Some knowledge of current popular culture will be a step towards learning about the students‘ interests. Such familiarity with their interests can mean the difference between being able to teach and interest students in your field, or presenting them with material that seems irrelevant.

**Conversing with Students with Disabilities**

The following guidelines are general suggestions for interacting with people with disabilities. This isn’t assumed to be an exhaustive list, but is rather a way for you to become more comfortable in the courtesies you extend. When talking with people with disabilities, observe who they are and do not refer to them as their disability.

**Guidelines for Conversing with People Who Have Mobility Impairments:**

- Consider the distance, weather conditions, and surfaces along paths of travel when giving directions.
- Do not lean on wheelchairs.
- When talking with a person in a wheelchair for more than a few minutes, place yourself at the user’s eye level.
- Allow a person using a wheelchair or crutches to keep them in reach. Remember that many wheelchair users can transfer to chairs, into automobiles, or into other seating arrangements.
- Ask wheelchair users if they want to be pushed before doing so.

**Guidelines for Conversing with People Who Have Visual Impairments:**

- When greeting someone with a visual impairment, identify yourself and others who are accompanying you. When you are leaving the space, let the person with a visual impairment know. Being blind doesn’t affect a person’s hearing, so use a normal tone of voice.
- Ask before giving help. When offering to assist someone with a visual impairment, allow the person to take your arm. It is helpful to give verbal instructions regarding stairs, changes in levels, and other barriers.
- Do not pet service dogs when they are working unless the owner tells you that the dog is at rest or play. When walking beside the owner, choose the side of the person away from the dog.
If you believe a person with a visual impairment needs help navigating (e.g., walking down stairs), first, ask if you can be of any assistance. If the individual does ask for assistance, guide his/her hand to the railing of the staircase.

Guidelines for Conversing with People Who Have Hearing Impairments:

- Before addressing people with hearing impairments, you may gently wave your hand in their line of vision or lightly tap their shoulder.
- When establishing whether a person with a hearing impairment can read your lips, look directly at the person and speak clearly, keeping your hands away from your mouth. Don’t over-exaggerate your speech and never yell; this makes lip reading more difficult. It isn’t necessary to slow down your speech unless you're asked to do so.
- Allow a clear view of your face by placing yourself near a light source and by keeping food and gum away from your mouth when speaking.
- If a person doesn’t understand you, rephrase the statement with different words that may be easier to understand when lip reading. Use gestures and body movements to help clarify your words.
- If there continues to be difficulty, try written communication, or arrange for a sign language interpreter for future communication.
- If an interpreter is present, speak directly to the person you are addressing, rather than to the interpreter.

Guidelines for Conversing with People Who Have Communication or Speech Impairments:

- Give your attention to the person who is speaking, even if an interpreter is present.
- Be patient; don’t speak for the person. Let the person finish his/her own sentences.
- Be supportive and encouraging by maintaining eye contact and refraining from looking at your watch or tapping your foot.
- Ask questions that only require short answers.
- If you aren’t sure you understood something, repeat what you did understand and wait for further explanation. Pretending to understand is not helpful.
Guidelines for Conversing with People Who Are Developmentally Disabled:

- Speak slowly and clearly. Use gestures and physical movements to assist in being understood.
- Keep a positive tone and positive facial gestures. Do not make movements that may be perceived as threatening.
- Treat people as they are. If they are adults, treat them as such. Don’t expect that people with developmental disabilities are like children. It is helpful to ask yourself: –Am I asking a developmentally disabled person to do something that I would ask anyone his/her age to do?!
- Ask before assuming that someone needs or wants assistance.
- Use specific and clear language.
- If a response is delayed, wait; the delay may simply mean the person needs more time to formulate an answer.

Guidelines for Instructors: Students with Visual Impairments

- Read aloud any instructions or material written on the board or on overheads used in the lecture.
- Give directions to the restrooms, laboratory, or classroom clearly, stating the distance.
- Allow students who are visually impaired or blind to make audio recordings of the lecture. The student will notify you in advance of such requests. Tape recorders or other recording devices for student use are available through student services programs.
- Allow students who are visually impaired or blind to bring note takers or Braille equipment with them into the classroom. Again, you will be notified in advance.
- Work with students and your campus office for students with disabilities to get appropriate formats of course materials to students in advance of the class. Electronic versions of documents generally offer the most flexibility, but each student may have unique needs.
Moving Forward

Discussing Student Marginalization

Find a way to relate the material to what the students already know, either by relating it to everyday experience or to material from a pre-requisite course.

Discuss the classroom environment as part of the introduction to the course. Make sure that every student, regardless of gender, ethnicity or background, will be treated fairly throughout the semester. Every individual should have equal opportunities to contribute and to learn. Make students get into small groups or talk to other students near them, and ask them to think of a couple of reasons why some students may feel left out or silenced in the class. Then, write down the reasons they generate on the board and ask the whole class to brainstorm for solutions.

Introducing the Material

Sometimes instructors jump right into the subject material and worry about procedural matters during another class period. Sometimes instructors manage to go over policies and procedures, and still have time left over to introduce the course material. In any case, getting students involved in the subject matter right away is a good idea, even if it is for a brief period of time. Pick an aspect of the course that you find most exciting. Your enthusiasm will become contagious. Furthermore, find a way to relate the material to what the students already know, either by relating it to everyday experience or to material from a prerequisite course. Try to get the students actively involved on the first day and to address students’ concerns.

Use the first day to help your students understand how the class will serve their needs, show your commitment to help them, and create a comfortable, open, and inclusive classroom community conducive to inquiry and participation. It would also be helpful if you itemize your time with them. This would involve identifying for yourself how much time you will allot to various topics. You might devote 5 minutes to introducing the basic outline for the course, 15 minutes for students to interview each other, etc. (For information about procedures for the first day in a science lab, see –The First Day‖ in the Science Lab section later in Part Two.)
Part Two: Teaching Methods

Summary of the First Day of Class

- Your conduct on the first day will set the tone for the rest of the course.
- Approach students with understanding and professionalism.
- Let your students get to know you. Share your enthusiasm for the subject you teach.
- Consider age differences in political views, activities, and sports and entertainment interests when interacting with students and giving assignments.
- If a student has a disability, use the guidelines listed above for courtesy and effective communication.