Fostering Effective Classroom Discussions

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Introduction

The theoretical and pedagogical developments in writing instruction over the last fifteen years have made fostering effective classroom discussions a crucial teaching skill. As we have come to focus on the teaching of academic discourse, the overriding metaphor in composition studies and writing textbooks has become that of helping students to "join the conversation." We have based any number of collaborative learning activities upon students’ ability to talk to one another freely and effectively. Indeed, social construction theory has built an entire epistemology and theory of cognition on the premise of effective talk. As Kenneth Bruffee puts it in "Collaborative Learning and the 'Conversation of Mankind'" [College English 46.7 (1984): 635—652],

We can think because we can talk, and we think in ways we have learned to talk . . . . If thought is internalized public and social talk, then writing of all kinds is internalized talk made public and social again. If thought is internalized conversation, then writing is internalized conversation re-externalized . . . . We converse; we internalize conversation as thought; and then by writing, we re-immerse conversation in its external social medium. (640)

As we look ahead to where composition studies and writing pedagogy seem to be going, our students’ ability to engage in effective discussion will apparently grow even more important. Our burgeoning disciplinary interest in civic discourse—in helping students gain the public rhetorical skills they will need to be fully active members of a participatory democracy—simply increases the importance of classroom discussion as a place to learn and practice essential discursive abilities. Facilitating more effective classroom discussions thus constitutes a fundamental first step toward improving the sad state of civic and public discourse in this country, toward helping our fellow citizens move beyond simply shouting at each other as a means of "communication" (as they do every night on such highly visible and influential political "discussions" as Bill Maher's "Politically Incorrect," for example).

Yet despite the tremendous current and future significance of effective classroom discussion, our professional literature in writing instruction is strangely quiet on the subject. We are, ironically, rather tight-lipped about how to facilitate effective talk in our writing classrooms. The published professional advice, what there is of it (see our annotated list of internet resources), comes from those professors who teach large lecture classes and are helping others to move out of that singular mode of delivery. It seems we simply assume that since most writing instructors were students in college literature courses that presumably encouraged discussion, they therefore know how to foster and facilitate discussion as teachers in college writing courses. This
assumption is not only spurious but also rather odd, given that the stereotype of an English undergraduate is that of an introverted bookworm. There is, however, a grain of truth to this assumption: given the paucity of available information, new writing instructors inevitably try, consciously or unconsciously, to mimic those professors from their pasts who somehow knew the knack of getting people to contribute in class.

But enough griping: it's time to rectify the situation. There is a long litany of things—concrete, pragmatic, proven things—that writing instructors can do to improve both the quantity and the quality of the discussion in their classrooms.

We begin, then, with a simple premise: classroom discussion functions best when students are talking to students. Indeed, our goal is to get as many students involved in talking to one another as possible and for the teacher to fade into the background. Students are well practiced in how to talk to and listen to teachers, in how to address and look to authority figures for answers. But they are not well versed in how to talk to and listen to each other, in how to navigate and negotiate and discuss issues of serious consequence and work toward answers among equals.

Moreover, we want to avoid class "discussions" that amount to nothing more than a perversion of the Socratic method, that amount to nothing more than a series of closed, two-person exchanges in which the teacher asks a question and an individual student answers the teacher, exchanges which lock the other students into the role of passive observers. We want as many students as possible to be as attentive and involved and engaged as possible; we want them to be agents in their own educations.

**Strategies for Fostering Effective Classroom Discussions**

1) **Set clear expectations for student participation in discussion sessions.**

Let students know the first day of class that a significant portion of their final grade for the course will be based on how effectively they participate in class discussion sessions, both in terms of the number of times they comment and in the quality of those comments. Keep your class roster handy during discussion sessions and mark who speaks and who doesn't. During conferences, ask those students who do not participate enough to "help you out" by speaking more in class.

You might even specify a class rule: "You are not allowed to say 'I don't know' in this class when asked a question. You are not required to know, but you are expected to think. So if I ask you a question and you don't know the answer, you are responsible to think of an answer, to guess, to speculate, to wonder aloud."

You can also foster effective discussions by helping students move out of the narrow, reductive agree/disagree formula that constitutes so much of the public and civic discourse that they are exposed to and have internalized. You can begin the course by expanding their notions of how to productively respond to comments in class, by asking them what they do when they talk to their friends over lunch, for instance, and filling the board with options outside simply agreeing and disagreeing with what the previous speaker said, such as adding new ideas, wondering,
compromising, telling jokes, questioning, complaining, telling stories, challenging, and analyzing.

Be sure to "prime the pump" for discussion days. Require students to demonstrate that they have already begun processing the material before you discuss it in class. For instance, you could make students hand you an "entrance ticket" as they enter class, a homework assignment which guarantees that they are prepared to engage in a productive discussion. This ticket could consist of their answers to a set of questions on a reading, for example, or a list of questions they have about the reading, or a paragraph that discusses the three most surprising things they found in the reading, etc.

2) Break the ice with informal talk outside of class.

Enter the classroom five minutes early each day, and while the students file in, ask them about their other classes, their progress on writing projects, current events, or other lighthearted topics in an informal manner. For many students, composition is their only class with fewer than thirty students. The composition classroom may be the only course in which they are asked to speak; conditioned by other large lecture classes, they may feel intimidated or "out-of-place" when called on. Informal "small talk" may help break the ice before a discussion, and a relaxed and comfortable student will invariably feel more inclined to add her or his opinions to the conversation.

3) Control and use classroom space strategically.

Karl Krahne (English Department, Colorado State University) notes that situating students equidistant from each other breaks down their protective space, gives the teacher access to them, and sets the stage for communication. In other words, having the students put their desks in a circle or horseshoe shape prevents them from hiding in corners or behind other students’ bodies. The circle improves communication by allowing them to see each other’s faces and hear each other’s responses without straining. And having them move their desks from rows and columns into a circle explicitly and concretely signals that a particular kind of class participation will soon be expected of them.

The circle or horseshoe shape also allows the teacher easier physical access to students than does the narrow passages of the row/column grid. This is important, because as Krahne points out, moving toward a speaker, lessening the physical distance between yourself and the student, establishes and narrows a communication channel. Think, for example, about how talk show hosts move out into the audience. Moving toward the speaker is a physical and unmistakable indication that you are interested in what he or she is saying and that others should be listening too.

Conversely, Krahne says, moving away from a speaker, increasing the distance between yourself and a student, widens a communication channel. As we back up, in other words, the audience grows as more people move into the speaker’s gaze.
Krahneke also suggests that working from among or even behind the students can lessen the threat from the teacher. That is, moving out from behind the "Big Desk" and sitting instead in a normal student desk as part of the circle is a concrete, physical signal that you want to be a part of the community rather than apart from it.

In like manner, he notes, lowering the communication channel decreases the teacher's authoritative role. Sitting down among your students lets you look at and talk to them across an even plane, rather than literally talking down to them. Remember that old nugget from your biology classes: there is a "fight or flight" mechanism that kicks in from the reptile part of our brain when we have to look up too far to see what is coming at us.

4) Use eye contact purposefully and strategically.

Krahneke suggests that establishing eye contact opens a communication channel and selects the student for a turn to speak.

Breaking eye contact during a student's turn and scanning the class, he notes, can distribute the student's communication throughout the class. That is, when the teacher breaks eye contact with the speaking student, he or she will follow the teacher's gaze and seek out someone else to talk to. The teacher's scanning eye also signals other students that they should be paying attention to the speaker.

Finally, Krahneke maintains, regular scanning can keep students engaged and can provide important feedback to the teacher. This is, in short, a surveillance function. If we are making eye contact with all the students in class, they are more likely to stay involved—and if they are not involved, we will know it immediately.

5) Avoid open questions; call on individual students.

Krahneke urges us to direct our questions to specific students and distribute turns around the room. This will increase the level of attentiveness on the part of the students, he says, and increase the number of students who participate. In other words, consistently asking questions that are open to anyone in the class to answer allows the hyper-verbal students to dominate and allows others to hide.

6) Ask good questions.

The kinds of questions we ask can make all the difference between an engaging and fruitful discussion and the verbal equivalent of pulling teeth. It is a good idea to write down a skeleton script of questions you want to ask during a class discussion, being open, of course, to follow a productive thread should it move away from your plan.

There are forms of questions to avoid. Listen to yourself in class, and if you find yourself working with these kinds of questions, consciously work to transform them into more productive forms.
A) the "Guess What I’m Thinking" Question—in which the teacher asks a question to which he or she already has a specific answer in mind. This makes "class discussion" into an attempt at mind reading for students. Questions like "What should Bob have done to improve his focus?" ask the students to guess at the answer hiding in your skull, whereas "What could Bob have done to improve his focus?" actually asks for their input.

B) the Yes/No Question and the Leading Question—in which the teacher’s question can be answered with a simple yes or no, which stops a discussion dead. Questions like "Do you think Didion’s conclusion is effective?" or "Wouldn’t you agree that Didion’s tone is whiny and annoying?" ask students to engage in nothing more than simple affirmation or negation, simple agreement or disagreement. Transform the question into something that asks for an analysis or interpretation, for example: "Why do you think she chooses to end the essay this way?" "How would you describe Didion’s tone?"

C) the Rhetorical Question—in which a declarative statement masquerades as a question to soften its blow and make it more likely to be accepted. Rhetorical questions allow us to foist our interpretations and ideas on our students while deluding ourselves that we are actually asking for their opinions. Questions like "Don’t we have an ethical and moral responsibility to inform parents that a convicted pedophile is moving into their neighborhood?" aren’t really questions, of course. Transform such sneaky assertions into actual questions: "What arguments, pro and con, can we generate about informing parents that a convicted pedophile is moving into their neighborhood?"

D) the Information Retrieval Question—in which students are asked to simply look in the text at hand, find specific, concrete information, and bring it back to the teacher. "What metaphor does Milton use to describe Satan in lines 617-634?" amounts to a classic example of mindless, page-turning busy work. Transform the question into something that asks for analysis or evaluation: "How does Milton’s description of Satan in lines 617-634 compare with depictions of the Devil you know from the movies or television?"
Suggestions for Classroom Discussion

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Fundamental Premise:
Although lecture can certainly be an efficient means of instruction, it often functions as an information delivery system rather than a learning experience. Engaging students in a carefully planned classroom discussion stimulates a more active role in the learning process. Learning is rooted in the experiencing of information, not in the information. Manipulating, extending, and expressing one’s understanding of information is what classroom questioning and answering is all about.

Preparing for Classroom Discussion

1. The typical college student (and many college faculty members) are far more familiar with questions that assess recall of information. Evaluating and applying information can be an unfamiliar opportunity for students (and possibly instructors). Ways of evaluating the quality of an answer—other than right or wrong—require consideration of criteria. For courses such as FOI, criteria are likely to include the validity of the premise, the quality of the evidence, the relevance of the evidence to the point at hand, and the logic of the conclusion.

2. Have questions prepared beforehand. Even if a discussion leader is familiar with the material, good questions may not come to mind spontaneously during the press of classroom interaction. It is easy to get caught up in the moment and let the discussion move into less relevant areas. Prepared questions can be kept on the overhead or on the board to keep everyone on task.

3. If questions are especially challenging and/or some members of the class are reticent to speak, pass out questions prior to the discussion period. Although instructors do, occasionally, want to see how well students can think about issues “on the spur of the moment,” many students are reluctant to engage in spontaneous debate. Truly controversial and complicated issues are probably best discussed after students have had time to apply the readings to specific questions.

4. If questions are especially challenging, the instructor might want to think through the options for "good" answers and the criteria by which these answers are evaluated. Thinking through possible answers should not prevent an instructor from being open to unanticipated alternatives.

5. Questions can take many forms. Four common question types include:
   - Memory Questions: Recall of information.
   - Convergent Questions: Connection known details to infer relationships among pieces of information.
   - Evaluative Questions: Making judgments as to the logic, reasonableness, or worth of an idea or argument. Judgments might be ethical, pragmatic, logical, etc.
   - Divergent Questions: Imagining new possibilities; original thinking that cannot be tested directly against known information. "What if" questions.

Suggestions for Facilitating Classroom Discussion

1. Use words with the vocabulary range of the students. This requires a tricky balance between teaching students new words but not intimidating students into not being able to provide an answer because they don't understand the question.

2. Pause after asking a question ("wait time"). Five seconds of silence can seem like an eternity, but students need time to process the question and construct an answer, especially when the question is convergent, evaluative, or divergent.

3. Don’t answer your own question. Once students realize that the instructor will answer his or her own questions, they begin to disengage.

4. Give a question to the entire class first. If you decide to call on a specific student, say the student’s name, repeat the question, and then wait for the response. For some students, hearing their name causes a brief moment of startle. They might well forget the question when the class turns their full attention in their direction.

5. Develop strategies to cope with the over-zealous student (the dominant talker) and the reticent student.
   - If a few students seem to dominate discussion, try asking for a raised hand to determine speaking order.
   - Some students seem never to speak, try putting students into small groups to discuss the questions first. Then ask each
group to present their answers for a particular question, using a different speaker each time. (e.g., four questions—four group members—everyone speaks).

- If a student continues to dominate or continues to remain silent, individual meetings with these students might be useful. Some dominant students may not realize how their behavior affects the classroom environment. Some reticent students may be high on Communication Apprehension and the thought of speaking up in a classroom discussion is actually painful to imagine. Talking such students through this fear can be helpful (as can providing them with the questions ahead of time).

6. Encourage lengthy responses and fully developed answers. Try follow-up questions such as "Under what circumstances?" or "How might that be accomplished?" or "Why do you believe that would be the consequence?"

Also use the discussion process to encourage more developed answers. For example, allow an abbreviated answer to stand temporarily while another student comments. Then return to the first answer and ask that student if subsequent discussion has altered, contradicted, or elaborated the original answer. This is a great way to facilitate dialogue between students. In addition, students often learn to provide more fully developed answers when they realize that their brevity has led to misinterpretation.

7. Try not to interrupt a student who is attempting to answer a question and don't allow other students to interrupt. Ethical communication involves the respectful acknowledgment (though not necessarily acceptance) of a different point of view.

8. Make the class responsible for their discussion. Instructors should facilitate, not carry or dictate, the discussion.

- Encourage students to comment on the responses of classmates before summarizing or moving to another question.
- Avoid repeating an answer. Let students assume the responsibility for the accuracy and audibility of their comments.
- When a student asks a good question, turn it back to the class to answer. If the class answers the question, then let the answer stand and move on. Don't undercut their efforts by re-answering the question as though only you had the right answer anyway.

9. Attend to nonverbal signals indicating that a student would like to ask a question, would like to answer a question, or would like to make a comment.

10. Be aware of your own nonverbal behavior when students are asking or answering questions. The body sends very subtle messages of approval/disapproval, interest/disinterest. For example, let a student finish speaking before looking down at your notes or at the clock.

11. Be aware of the problems inherent in five typical types of classroom questions.

- The Dead-end Question: Requires only a yes/no response. For example, "Can animals communicate with each other?"
- The Programmed-answer Question: Doesn't necessarily require only yes or no, but does indicate in its form what the intended answer is. For example, "Many scholars say that animals can communicate with each other, but are they using signals or language?"
- The Chameleon Question: The question begins in what seems to be one direction and then switches to a different direction. For example, "If language requires both symbols and rules for combining those symbols, can animals have language? That is, if a chimpanzee can be taught to make the sign for banana, does it have language?"
- The Fuzzy Question: A variation of the Chameleon Question that does not even contain the clarity of a directed question. For example, "What do you think animals communicating?" Such questions might well elicit responses ranging from "Well, I like it when my dog wags his tail" to "I don't believe that animals do communicate in the sense of constructing messages in order to express their needs, act on their physical environment, and build social bonds."
- The Put-down Question: A largely rhetorical question that minimizes the legitimacy of a comment or closes down addition discussion. For example, "Can we all see why Mary's solution is not feasible?" (Not only does Mary get put down, but only the boldest of students would speak up if they actually had thought that Mary's solution was pretty good). Or, "Well, Paul answered that question fully. We certainly can't add to that, can we?" In this case, Paul was not put down, but any student who might have wanted to add to the answer will have to re-open the issue at some risk.
745. Using Class Discussion to Meet Your Teaching Goals


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Folks:

The posting below, longer than most, looks at several ways to promote successful classroom discussions. It is by Kelly McGonigal, Ph.D., in the Psychology department at Stanford University. It appeared in the newsletter: Speaking of Teaching, Center for Teaching and Learning, Stanford University - Spring Fall 05, Vol. 15, No.1, http://ctl.stanford.edu/Newsletter/produced by the Stanford Center for Teaching and Learning. Reprinted with permission.

Regards,

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Using Class Discussion to Meet Your Teaching Goals

If you ask most instructors what their primary goal during a classroom discussion is, the answer seems obvious: Get students talking and keep them talking. For any instructor who has struggled to break through the stubborn silence of tired, timid, or unprepared students, success may be measured by the minutes of sustained student speaking. However, while student participation is necessary for successful classroom discussions, it is hardly sufficient. Students can talk for hours without learning anything of substance. Truly successful classroom discussions are guided by specific teaching goals such as increasing students' comfort with the specialized language and methods of a field or developing critical thinking. Each teaching goal will suggest different strategies for guiding a classroom discussion.

This newsletter reviews several teaching goals that are well-served by discussion:

1. Increase students' comfort with the specialized language and methods of a field.
2. Develop critical thinking.
3. Develop problem-solving skills.

Increase Students' Comfort with the Specialized Language and Methods of a Field

All fields have a terminology shared by scholars and professionals in that field, as well as commonly understood approaches to solving problems and discovering knowledge. One of the main goals of both introductory and advanced college courses is to help students learn to think like an economist, a sociologist, a biologist, or an historian by learning the language and methods
of a field. Discussion is an excellent forum for learning to think like a specialist by giving students a chance to practice analyzing the world through the lens of a particular field.

Exercises and Prompts

Analyzing texts or examples from the field.
In class, provide students with a basic framework for analyzing a text, problem, or example in your field. What should students pay attention to? How would a specialist talk about this? A good example for any kind of physical or social science is how to analyze a study. What are the components of a study that students should pay attention to? For the humanities, it can be the process of analyzing a particular kind of text. For engineers, it might be how to begin thinking about a design goal and the specifications given for a project. Allow students to practice talking through a basic analysis by identifying the things that matter and practicing use of the terminology. You can apply this same process to discussing real-world events: How would an economist think about this? What issues would the economist be most concerned about?

Comparing texts or examples from the field.
One step up from analysis is comparison. Ask students to compare and contrast two texts or examples. This helps them focus on what matters in your field. What distinctions are most important? Which details are critical? How do you know "good" from "bad"-what are the value judgments made in your field? Should students attend to the elegance of a theory or solution, the logic of an argument, the comprehensiveness of a report, or the lines and color of a painting? After years in your field, this may seem obvious, but it is a perspective acquired only through practice.

Guiding Discussion
It is especially important for the discussion leader to provide both a model for thinking like a specialist and a structure for student discussion. Before starting an open discussion, you might ask students to recall some new terminology introduced in lecture or the reading and walk them through the process of applying that terminology to an example. However, students need more than a review session. They also need a chance to think for themselves and internalize this new way of viewing the world. So you'll want to walk students through a specific process at least once and then give them many opportunities to practice.

Encouraging Participation
All students need a chance to practice using a new language or method. A large-group discussion can limit participation, giving only a few students full opportunity to practice. The typical solution to this problem is to have students pair up to discuss a question or problem for five minutes and then bring them back for a full-group discussion. Variations on this theme can maximize each student's participation and exposure to other students' ideas:

Partner swap
Have students pair up for a series of practice or discussion rounds and rotate partners for every new example or question. This format works well when you want students to practice a simple skill such as analyzing the meter of a line of poetry, but not when you want students to develop a complex skill such as analyzing the historical context of a poem.
Two, four, six, eight—have students discuss a question in pairs
After a few minutes, have pairs partner up (four students discussing the same question); after a few more minutes, have those small groups pair up. You can do this all the way up to a full-group discussion. This format works best when you can create a topic that has many levels of discussion. For example, have the pairs analyze a basic aspect of the text or problem (What is the hypothesis of this study, and how did the researchers test it?). In small groups, have students discuss a more complex issue (Do you think the methods are a good test of this hypothesis? What aspects of the study design would you change? What are the ethical concerns in this study?). In larger groups, students can discuss their reactions, share ideas, and build on each other's suggestions.

Trouble-Shooting
When students are not already heavily invested in a field, even important exercises can lack intrinsic interest. If students' participation is lackluster, it can help to have a basic discussion about what makes your field and its approaches unique. An instructor's enthusiasm for his or her field is probably the single biggest influence on whether students find it equally compelling. By focusing on the big picture, you may be able to interest students in the smaller details. You can also connect what students are doing to the activities of scholars or professionals or those in your field. Students often don't understand how skills learned in introductory, or even advanced, classes relate to the kinds of original scholarship or careers that they are interested in.

Develop Critical Thinking
Critical thinking is an important goal in most fields, whether it is used to analyze the logic of a philosopher or to find the potential problems with a proposed healthcare initiative. Discussion is an excellent tool for developing students' reasoning skills because it gives you access to their thought processes and an opportunity to guide students to a higher level of thinking.

Prompts and Exercises
Critical thinking can be applied to any text, claim, or open-ended question. Choose topics that are likely to provoke student interest but not necessarily topics that students already have strong and passionate opinions about. To teach critical thinking, you need a window of open-mindedness and curiosity.

Stir up controversy
Provide students with a provocative or controversial quote from some expert in your field (possibly a guest lecturer or the author of a class text). Use the expert's claim as a challenge to students: Is this expert right? How would you decide? What information do you need? What information do you have? Payne and Gainey (2003) have developed a list of controversial claims in many fields, from marketing to medicine, that may be useful for your course.

Provide alternatives
Give your students two competing claims, conflicting theories, or any set of alternative options. Instead of taking a vote, or asking students to immediately choose a side, start with a question that encourages open thinking. What is the issue here? or What is this really a choice between? can launch a deeper conversation than Which do you agree with? Ask students to describe the
perspectives that inform each alternative and critically discuss those perspectives as much as the actual claims.

**Guiding Discussion**
Make sure students understand that discussion is not simply an invitation to restate their opinions. Remind them: The goal of critical thinking is to examine your own assumptions and evidence, not just to criticize the thinking of others who disagree with you!

Focus your attention on the quality of students' reasoning, not just the content of their reasoning. Instructors need to be able to recognize both common errors in reasoning (such as making unsupported assertions and using anecdotal evidence) and the signs of high-level reasoning (such as focusing on empirical evidence for a theory and the ability to integrate personal values with evidence). Greenlaw and DeLoach (2003) suggest that instructors spend time reflecting on what different levels of reasoning look like in their respective fields. What are the most common forms of uncritical thinking in your field? What is the gold standard for critical thinking applied to your field?

A discussion leader can then focus on guiding students from common reasoning errors or simplistic reasoning to more complex or high-level reasoning. When students make a claim, ask them for their evidence or logic. Then ask the class to evaluate the evidence or logic. Encourage students who disagree on a point to identify the source of the disagreement (i.e., trusting different kinds of evidence or weighing certain values more strongly) rather than simply the point of disagreement.

Encourage students to talk to each other, not just to you. Keep your own contributions content-neutral. Don't take a stance; simply probe students' thinking. If necessary, ask a student to play the devil's advocate role, rather than playing it yourself.

**Encouraging Participation**
Encourage listening as much as talking. Students often concentrate so hard on what they are going to say, and how to score points, that they fail to really listen to others (Hollander, 2002). To help students develop their listening skills, encourage them to repeat the last important point and then respond directly to it (rather than stating a new opinion). Encourage students to keep building on a particular argument or interpretation. Make sure that you reinforce all forms of helpful contributions such as asking good questions or connecting points that other students have made.

Students rise to the occasion when their peers demonstrate a high level of reasoning (DeLoach and Greenlaw, 2005). When critical thinking is the goal of discussion, it can be helpful to focus first on the "high contributors" in the class, rather than trying to equalize participation among all students. Encourage students who make high-quality contributions and acknowledge what made the contribution useful. Once a norm is established, other students will be more likely to maintain the high standard of discussion. If a few students monopolize the discussion, you can invite others to comment or break the class into smaller discussion groups.

If you have a hard time starting discussions with your class, ask students to rate their agreement with a claim on a scale of 1-5. Then ask them to write down five reasons that they agree or disagree with the claim. A student with a 2 rating writes two reasons that the claim is compelling and three reasons that the claim is not compelling; a student with a 5 rating needs to come up
with five reasons that support the claim. This guarantees that students will have something to say and acknowledges thoughtful ambivalence as an appropriate position.

Trouble-Shooting
The most common anxiety instructors have about critical discussions is that they will turn into emotionally charged debates. If you manage to find a topic that truly engages students, you do run the risk of having personally invested students feel attacked by students who disagree with them.

If a discussion turns into unproductive debate, take the power away from the students who are most involved. Ask other students, not involved in the current debate, to identify the issue that seems to be causing the conflict: What do you think they are really arguing about? Does anyone see any common ground between the two? Let these students analyze the discussion, with less emotional charge.

If the debate turns into a personal attack, the best response is to clearly state that personal attacks are inappropriate in the classroom and quickly refocus the class. You can speak with students involved after class or even have the entire class reflect on the incident in a writing assignment, but it is not usually productive to pursue the issue during class discussion.

Develop Problem-Solving Skills

Problem solving requires both divergent and convergent thinking. You can encourage students to find creative solutions to complex problems, and you can also teach individuals how to come to a collective decision.

Exercises and Prompts
Choose a problem relevant to your field, preferably one with more than one correct answer. Describe the problem in enough detail to interest students-explain why it matters, what is at stake, and what the benefits of solving it might be. The following exercises and prompts for discussion can be used together to develop both divergent and convergent thinking.

Brainstorming
Most brainstorming sessions focus on generating as many solutions as possible. You can expand this approach by asking students to brainstorm for each important step in the problem-solving process. Have students brainstorm for relevant information (What do you already know about this problem and its causes?), important considerations (What are some things that a solution needs to accomplish and take into account?), possible solutions, and possible obstacles.

The deliberation
Create a problem that requires making a decision or choosing a specific course of action (Parker, 2001). When you introduce the problem, explain that the goal of discussion is to come to a consensus. This is an important problem-solving skill for all fields that require group decision making, such as business, politics and policy, engineering, or healthcare.
Two solutions
Once a problem is introduced and students have engaged in some brainstorming, you can split the class into two or more groups. Each group develops its own solution or decision and presents back to the full group at the end of class. This is a great strategy to use if you can create a scenario based on actual data about a historical event or experiment (such as a design failure that led to an improved design or different methods for improving medical compliance in underserved communities). When groups present their decisions, you can give them feedback about the real-world consequences of their choices.

Guiding Discussion
Ask questions that orient students to important parameters, considerations, and issues. To begin the discussion, ask students for what Davis (2001, p. 67) calls "first approximations" - not their solutions to a problem, but an idea of what might be relevant, additional information they might need, or any initial reaction to the problem posed. Before they discuss the solution, ask students to propose methods for approaching the problem.

Help students keep track of the progress toward a solution by documenting the discussion on the board or overhead. If discussion stalls, use the map you have created to redirect students' attention to an important consideration or missing piece.

If discussion turns into debate without any signs of moving toward consensus, you can intervene and ask for a vote. This gives you an opportunity to discuss how a minority's objections might be taken into account, even as a majority's decision is accepted.

Encouraging Participation
Routinely invite comments from quiet students. If a few students have dominated the discussion, simply state, "I want to know what others think about this plan before we move on." In a small class, you can ask every student to provide one idea in each brainstorming session. In a larger class, give students time to write their ideas first, so that all students will have had the opportunity to think.

The classic fishbowl approach to discussion can create diversity in the discussion and encourage students to reflect on the process of problem solving. Select a few students to discuss the problem, while the rest of the class observes. Then invite the observers to discuss the process of problem solving that went on.

Trouble-Shooting
Creative and effective problem solving requires motivation. If students are uninterested in the problem or the process of solving it, the discussion can stall (and the class can seem like mild torture to the discussion leader). To motivate students, increase the stakes of the problem by making it personally relevant or of a bigger scale. Surprise students by suggesting an outlandish solution and ask students to make it workable. Or better yet, ask students to come up with the worst solution they can think of and then flip the solution to find something useful. Students can do this in pairs or small groups.
Students are also much more motivated when they think that their contributions have influenced the course of the discussion, and they can see how their comments have influenced the group's solution to the problem (Brookfield and Preskill, 1999). Simply writing each student's main point or suggestion on the board can make students feel "heard." You can also ask the group to follow up on a comment that seemed to be ignored or dropped.

**Reality Check: Assessing Student Learning**

Brief end-of-class writing assignments (turned in during class) and homework can be used to reinforce students' learning and check how well a class discussion met your teaching goals. One simple option is to take the basic format of class discussion and turn it into a written assignment. If you uncovered any major gaps in student understanding, revisit the topic at the end of the discussion and base any follow-up assignments on this area. Email or online discussion boards are also an excellent way to extend classroom discussion. As homework, you can require every student to submit an online response to a question posed in class.

To help students reflect on the discussion process, ask students to write about how the discussion changed their thinking or understanding (Davis, 2001, p. 72). You can also ask students to assess the quality of the class discussion. Ask them to evaluate their own contributions and how they might improve their participation. If the discussion involved any major conflict or disagreement, ask students to summarize the conflict, evaluate how the group handled it, and add their own perspective. To find out what students understand about problem-solving strategies, ask them to make notes individually about how the class solved a problem, along with general suggestions for solving similar problems.

**Bibliography**


