Chapter 8 - Using Active Learning in the Classroom

Active learning shifts the focus from the teacher and delivery of course content to the student and active engagement with the material. Through active learning techniques and modeling by the teacher, students shed the traditional role as passive receptors and learn and practice how to apprehend knowledge and skills and use them meaningfully.

- **What is "active learning"?**
- **Integrating Active Learning into the Classroom**
- **A Sampling of Active Learning Techniques**
- **Additional Active Learning Activities**
- **Resources for Active Learning**

What is "active learning"?

Active learning involves providing opportunities for students to meaningfully talk and listen, write, read, and reflect on the content, ideas, issues, and concerns of an academic subject. (Meyers & Jones, 1993, p. 6)

Research and anecdotal evidence overwhelmingly support the claim that students learn best when they engage with course material and actively participate in their learning. Yet the traditional teaching model has positioned students as passive receptors into which teachers deposit concepts and information. The model has emphasized the delivery of course material and rewarded students adept at reflecting the course content on assessments. The spoils have tended to go to students with good short-term memories and reading skills.

Among the student population, there have always been those who have the wherewithal to make connections among course concepts, generate and ask themselves meaningful questions and then search for answers, and interact with readings through annotations (i.e., dialoguing with the texts through notes in the margins rather than the copious highlighting that leaves most textbooks filled with more secondary colors than black on white).

However, the majority of students need to be provided with active learning opportunities to approach this ideal; and even those who are self-directed will learn more and be able to apply their learning more adeptly when course activities are based on active learning.

Active learning shifts the focus of instruction from what should you, the instructor, teach or deliver to students to what do you want students to be able to do with course material. Similarly, students must enter class prepared to use assigned readings and reviewed material from past classes, etc. Not only are students expected to be up-to-date on course material, but to have assimilated the material so they can use and build on it. When students recognize that your course involves active learning, they will also recognize that they must be active if they are to succeed in the course.

Active learning techniques are not educational magic bullets. Of course some of your students may not be willing to abandon their passive roles. But between those who are self-motivated and those who choose to sink, there is most likely a large middle group who, with some facilitating from you, will be active learners and markedly improve their performance and long-term command of the material.

The obstacle to integrating active learning techniques into your class is contained within Confucius's aphorism:

I hear and I forget.
I see and I remember.
I do and I understand.

Unfortunately, in most physical and virtual classrooms, we are limited to the very senses Confucius claims to be ineffective pathways for understanding. When used in isolation, hearing or seeing (or reading) does not make for the kind of learning we aspire to create in the classroom. We have all been students listening to lectures and filled with trepidation that we would be responsible for information that, even as we heard it, was slipping through our grasp. We have watched slides or videos and wondered how we could integrate the images into our knowledge banks to be accessible for use in some future exam.

This chapter presents active learning techniques that can help mitigate the limitations of most classroom situations. Still, grasping the principles of active learning will do far more for your teaching than simply using these activities as if they are templates to be filled in with your respective content. Rather, use active learning principles to develop activities for your students that best reflect both your own teaching style and the material, types of thinking, and approaches to the subject necessary to comprehend and apply the topic. Doing so will make you an "active teacher," and you will cross beyond the essential, but incomplete, role of content expert. Content expertise and active teaching will provide students the opportunity to become engaged learners and dynamic thinkers.

Active Learning Techniques Support the University's Instructional Goals

When students learn actively, they retain more content for a longer time and are able to apply that material in a broader range of contexts.

Many faculty members assume that their role is to teach. Instead, think: *My role is to help students learn.*

New research shows that faculty who are facilitators, collaborators, leaders, and organizers are having great success in helping students prepare for lifelong learning and making them more capable to work in fields where they must acquire new skills and knowledge regularly.

Integrating Active Learning into the Classroom

Active learning can be applied to most commonly used course activities, depending on whether they involve the student or they position the student as a receptacle passively receiving content.

Even lecturing, which may seem to be inherently passive, can be an active learning experience if the following are integrated:

- Students are provided with a set of questions as well as instructions to look for answers within the lecture.

- During pauses in the lecture students are asked to jot down questions. The following class may then begin with these questions, which can function as connectors from the previous class to the present class.

- Students are periodically asked throughout the lecture to (silently) make connections between the current material and course materials covered previously.

Additional Methods for Cultivating Active Learning in the Class

In addition to using active learning techniques in your class (such as the ones described in this chapter), you can also model the principles. For example, your students may have *passively* read throughout their lives, so a simple direction to annotate and interact with text may not lead your students to actively read. Show them your own examples of active reading, using a page from their own assigned reading. Then

have them submit a page or two of their own active reading, at first, and comment on it, showing them where one more *vertical* step in their thinking about the text, or how using the text to reflect on the larger subject of the course can broaden and sharpen their thinking and learning.

Make your examples sufficient and competent, but do not make them so superior to your students' efforts that they demoralize the very audience you are trying to inspire. Cross-outs in the margins or, in something like a journal exercise, questions that reveal your own uncertainty on an issue or about a concept can help students see that knowledge is often constructed rather than just hooked swiftly in a process available only to the chosen.

Similarly, you may periodically stop discussions and offer suggestions for how students may have modified their comments to engage and build on what another student or students have said (or, if online, posted). You can model ways students can cooperatively build validity and move vertically in their discussions rather than simply free associating and moving horizontally away from the focus of discussion.

As you may have inferred from the discussion above, facilitating active learning may require that you put yourself at risk – you model learning; you give up the unilateral flow of the traditional teaching format; you uncover the topic at hand and permit students the inevitable chance of asking about some corner of it with which you may not be totally at ease or about which you may need to say: "I'm not sure, but I'll refine my own thoughts and present them first thing next class" (or on the discussion board, if you are teaching via a course website).

For your risk, what do you get in return?

- Students who may get excited about the subject

- Students who may learn not only information about the subject but also how to think about the subject (and imagine how valuable that skill is in disciplines where paradigms and ideas are quickly changing and increasing.)

- Students who may believe that you are passionate about learning the subject and who catch your enthusiasm

And even if you do not know that you have touched more than a few students, you will know that you provided opportunity for students to make better use of their ability to learn.

Initial Preparation Time

It is reasonable to think that integrating active learning techniques into your teaching is going to take more time to prepare. However, once active learning is incorporated into your class, you can use and refine the techniques relatively easily.

And because your students will be making course material part of their long-term memory and will be able to apply essential course concepts and theories, less course time will be needed for reviewing material and answering questions on content, and more time can be used for higher-level thinking activities.

Are some teaching contexts not conducive to using active learning techniques?

You may reasonably think that if you teach large lecture sections that actively involving your students in the learning process is not feasible. It may be a bit more difficult to conceptualize how you can make it work but most active learning techniques, with some modifications, can be applied in large classes.

The guiding principle can be applied to any learning situation. You cannot force students in a lecture hall to engage actively with the material, but you can give them the opportunity. For example, a handout with basic questions not only prepares students for your presentation, but also provides the student, under your direction, a chance to summarize the material as answers to the questions.

If you teach a survey course that requires covering a broad expanse of material, you may think that using active learning techniques will not permit you to cover the course material.

Many professors have an overwhelming need to "cover all the material." This approach may not be an efficient strategy.

Consider these statistics reported by Meyers and Jones (1993).

- Students are not attentive to what is being said in a lecture 40% of the time.

- Students retain 70% of the information in the first ten minutes of a lecture but only 20% in the last ten minutes.

- Four months after taking an introductory psychology course, students know only 8% more than students who had never taken the course.

The implication of such research is that you need to evaluate and perhaps discuss with others in your department depth vs. breadth of coverage. You may want to ask a professor who teaches **the next course** in your curriculum what is necessary for students to know when they begin that course. You might just find that it is much more concentrated on analysis and use of content than recall of the content.

A Sampling of Active Learning Techniques

All active learning techniques are intended to help learners make relevant connections among course materials; transforming course materials from opaque language or ideas into something learners can integrate into their own long-term memory and knowledge bank. The activities that follow are intended to help learners achieve these objectives. Instructors may, however, find that some just do not fit their style of teaching or that others would work well in their classroom or online environment with modifications. Other instructors may find that many activities they have done or currently do in class need only be infused with active learning principles to become active learning techniques.

Active Listening

The Intention

Active listening gives students a chance to practice restating in their own words what they have heard. As students form and restate concepts in their own words, they both gain a deeper understanding of the material and recognize where their grasp of the material is insufficient.

The Activity

Paraphrasing spoken statements

- Students pair up. You do not have to classify students as those who understand and those who do not - simply ask students to pair.

- One student explains a concept, principle or method to another.

- The listener paraphrases what the teller has said and seeks clarification if necessary. The listener may use such phrases as "What I hear you saying is…" and "You're saying…" The listener seeks mainly to reflect the teller's statements back to the teller accurately and does not try to analyze, judge, or lead the direction of discussion.

Active Writing

The Intention

Some commonly used short writing assignments ask students to reiterate what the instructor has said in class or what an authoritative document, such as a textbook or article, has stated.

Many of the following suggestions build on those short writing assignments by asking students to think in writing about those facts, concepts, and issues delivered by content experts.

As students "think in writing" they clarify the material for themselves and see what they understand and what they need help in making sense of it.

Through writing, students order and organize the material so they can comprehend both the larger picture and the supporting details - building a ladder of abstraction that helps them see the relation among topics and subtopics.

Students can use writing to explore a topic or class material, using the pen as a flashlight that provides them the opportunity and the confidence to think beyond the statements and thoughts of others and to forge connections among isolated concepts.

In their work *Promoting Active Learning,* Meyers and Jones (1993) suggest that when students are directed to write for specific "rhetorical contexts" - a specific audience, situation, and purpose - they are more apt to write clearly and coherently, than when they think they should model the opaque, stilted prose they associate with academic style and language.

Note: Even when provided explicit instructions for a writing assignment, many students may not understand what is required of them. A good way to inform students of what you expect is to create and model (briefly) their writing assignments by offering an example that reflects the limits within which the students will write.

For example, if they will be able to produce only a first draft, then a model should not be perfect or the result of many drafts, and should contain the same kinds of flaws that would appear in a typical example.

The Activities: For Individuals

Submitting questions

- Ask students to write down and submit any questions they have at the end of each class.

- The answers to these questions become the beginning of the next class.

- This technique can be used to gauge student learning, as well as to motivate students to listen. It also provides a way to review course material before moving forward.

Writing a summary of summaries

- Students write a 2-3-page summary of an assigned reading and exchange summaries.

- Each student then writes a 1-paragraph summary of the other person's 2-3-page summary.

- The resulting summary of a summary can be presented to the class.

Writing to determine comprehension

- Stop in mid-lecture and ask students to write a short list of everything they know about the topic or a sub-topic.

- Ask a few students to share the results of their "brain dumps." This technique can help students remain attentive and provide feedback to you about the students' knowledge or misunderstandings.

The Activities: For Groups

Note taking and revision

- Have a "Notes Completion" session.

- Ask students to exchange notes and fill in any gaps they identify.

- This technique helps them generate complete notes as they review the course material.

Editing the work of others

- Have students write short papers, exchange them, and edit each other's work.

- *Guided* is the key for successful reviews. Students will need specific instructions on how to edit the writing of others, so provide them with a writing review rubric that organizes criteria for grading.

- Model "constructive" criticism. Many students do not know how to explain their responses in helpful ways.

Guided peer review of written work can be extremely helpful. It emphasizes that students should always take the editing process seriously, and it gives them an idea of the process that the professor uses to assess student writing.

(This process could be done several times before the final paper is due.)

Visual-based Active Learning

The Intention

Visual media, such as films, videotapes, demonstrations, and even TV, have the advantage of being easy to deliver in most classroom or online environments and are inherently interesting to the current generation of students. In addition, because many visual media are temporal and active, rather than static, they can be used to show change and dynamic qualities, which can be especially useful in teaching the sciences or even dance.

But the same qualities that make visual media eye-catching may also mitigate its educational value. Although students may watch images on a screen with apparent interest, without your guidance, they likely will become passive receptors of visual data.

Whatever media you use, you should guide students in attending to certain aspects of the presentation through questions either delivered before the presentation begins or by periodically stopping the presentation to ask questions or have students draw connections. You may even want to describe to students how they should watch or attend to a visual presentation. (Viewers do not naturally examine the more subtle movements or sounds in a frame.) Unless a visual medium is used to trigger learning, regardless of its quality or instructional merit, it will most likely not be integrated into students' long-term memory or deliver concepts or information students can apply.

Note: Most visual media is temporal and, unless digitized, it will be especially difficult for you to locate isolated segments.

The Activities

Films

- Films, as well as other visual media, can be stopped and important segments viewed, discussed, criticized, or reflected upon.

- Students can be given questions to answer as they watch.

- Groups can be established to discover or examine specific points.

- One of the most interesting uses of this media technology is to allow students to film their own projects. Some have their own cameras; others can check out cameras from media centers or departments. The best of these films might be used in future classes.

Overhead projectors or presentation software

- Intersperse, among the slides, questions or activities for the students.

- Another way to get students active is to give them the overhead transparency and pen and allow them to do problem solving as individuals or groups.

- Just one reminder. Do not put your notes on presentation software, project it in your class, and then read it to the class!

Demonstrations

- During interactive demonstrations, ask students questions such as: "What will happen if...?"

Brainstorming

The Intention

Brainstorming, in which students are encouraged to generate as many ideas on the topic as possible without judgment or critique when they are made, can be used in many learning contexts, whether solving a problem, generating questions to ask about a visual presentation, or summarizing the key points of a lecture. The operant word in the definition of brainstorming is generating. Students can use this session as an opportunity to make connections, free associate, and recognize that they have been engaging with the topic in ways they may not have been aware.

The Activity

Group brainstorm

- Begin by asking a question or suggesting a topic.
- Have someone make a list of the ideas on the board or overhead.

These ideas can be the stimulus for a discussion to follow, topics for projects, topics with which students need assistance, or even important points that might be included on an assessment later.

Collaborative Learning

The Intention

Recent research suggests that individuals in small groups learn better than they do on their own or in isolation. In light of the research on active learning, this is not surprising, as a small group initiates collaborative learning and its resulting activities: students generate questions, discuss and arrive at conclusions, turn thought into written or oral language, etc.

Any size class can benefit from collaborative learning. With some modifications, groups can be successful even in very large lecture classrooms.

Some things to think about before you use collaborative learning:

- Some teachers have reported that **starting groups** at the beginning of the semester is difficult. Some time is needed for students to get to know one another. However, getting students in groups, especially in large classes, is a way to help them get socialized.

- There are **physical limitations** to grouping - plan for them. In a class with the chairs permanently attached to the floor, group size might have to be limited. Desks, chairs, and tables that can be moved will need to be moved. When students get in the habit of working in groups, they will do the rearranging. Try to arrange chairs so that: you can walk around to each group; you can speak to the class as a whole when you need to; all students can see projections or demonstrations while they are in their groups.

- Researchers say that effective groups have three or four members but there are other situations in which two students are effective. Some faculty members give each student a role in the group; others let students choose the role that best fits them. Teachers sometime assign groups; others let natural groups form. Some keep the groups the same all semester; others rotate members.

- Assessment of group work can be the most difficult aspect. Some students will reject being assessed as a group. Sometimes the group will contain a mix of laggards and gung-ho students. This is where clear instructions and precise elaborations on grading are important. Common methods of grading collaborative work move along a continuum from giving the group a grade as a whole to giving each student a grade depending upon the part he or she played in the group. Another idea is to let the groups do internal assessments of its members. Also, if a presentation to the class is involved other students could evaluate it.

- Explain the nature and value of putting students into groups. What will they be able to accomplish in a group more effectively than they could do alone? Be sure the group activity contributes toward meeting a desired learning outcome.

- Give clear directions to the groups before they physically move. Let them know what they should do in groups and what their product will be. To promote positive interdependence and individual accountability, outline the degree of collaboration you expect, and for longer-term projects, design enough tasks for every member. Determine if you or the group will distribute the workload and be clear about evaluation criteria. Will each student in the group receive the same grade?

The Activities

Group problem solving

- Stop the lecture to ask groups to solve a problem, do an activity, find the important points, or the most confusing point, create an outline, create a test question.

Think-pair-share

- This activity starts with each student working individually on a problem for a short time; then students pair up to compare, synthesize, and finish the assignment. Later they report to the whole class. This can be expanded to create a pyramid when those two students now work with two more, and then report to the class.

Debates

- Ask debaters (who might be a team) to debate issues based on verifiable evidence, to clearly state points, to logically organize issues, and to be persuasive.

- Those not participating in the debate are the judges. They should have or establish criteria upon which to base their decision.

- Non-participants should also record at least one point that the debaters on each side should have made but did not.

Peer Teaching

The Intention

You never really know something until you try to teach it to someone else.

Each time you step before your class, you marshal a range of skills and knowledge that, together, enable you to guide students toward comprehension of the course material. And you have most likely recognized that in preparing and delivering your course, face-to-face or online, you have come to master the material in a way that is different, and superior in some ways, to the mastery obtained through the role of student.

Any activity that requires your students to modify and broaden role and performance will encourage active learning.

The Activity

Teaching a topic

- Help students adjust to this new role by having them teach to a small group. Three or five students pose less of a threat and lessen the degree of failure or embarrassment a student/teacher faces.

- Remind them of all the active teaching and learning techniques that they could use and give them ample preparation time. Most students will not have a clue what you want them to do, so try modeling what you want them to do in their "teaching" experience.

- Instead of choosing topics in the required readings, choose topics that will supplement the class. This ensures that students do research on their own.

- Select some of the more effective students to teach to the entire class. You may wish to participate as a student and ask helpful or follow-up questions that require the student to extend herself.

Role Playing, Drama, and Simulations

The Intention

Role-playing can often stimulate affective qualities such as empathy, as well as understanding of concepts, points of view, and external constraints on personal action. Putting all the theories into practice, simulation can be the students' first chance to face the realities of what they have learned and the attitudes they have connected to the learning. Simulation is a growing topic on the Internet and a search in your discipline may show several simulations that you can use for your classes. Even in large classes the following activities can work.

The Activities

- **Adopt a role**
  - ◇ Assign a writing assignment to students while they are in the role of another person. What would that person do and what reasons would they have for doing it? How would that person feel?
  - ◇ Have a few students read or act out their writing.

- **Understanding Audience**

  ◇ Ask students to discuss or write in one way for one audience and another way for another audience so as to demonstrate their understanding of how different audiences have different levels of knowledge on an issue and have different emotional investments in a conflict or issue.

For example, how would you explain to undergraduate students the accounting concept "return on investment," compared to how you might use it to persuade a client to buy a piece of property?

Problem-Based Learning

The Intention

Problem-based learning (PBL) begins with a problem prepared by the instructor that generally cannot be easily solved without data collection and mastery of subordinate skills. Students search for resources, and/or faculty guide students to information and resources. Instructors help students learn to frame the right questions, formulate problems in clear and organized language, explore alternatives, and make effective decisions.

The theory is that by solving problems students learn to generate procedures that they can use again should they encounter another, similar situation.

Some of the characteristics that make PBL ideal for active learning include the following:

- Students experience learning in a collaborative and supportive environment.

- Instructors enhance student motivation by providing real life problems.

- Students seek useful and relevant knowledge to apply toward job skills and employment.

- Students identify, analyze, and resolve problems using knowledge from previous experiences and courses, rather than simply recalling it.

- Students are self-directed in their learning.

The Activity

Plan and develop a solution

- Students confront a given problem in groups, organize prior knowledge, and attempt to identify the nature of the problem.

- Next, they pose questions about what they do not understand and then design a plan to solve the problem and identify the resources they need.

- Students must gather prior knowledge as well as information that they may not have understood in the past as they work to solve the problem.

- Solutions may be demonstrated to the class.

Team-Based Learning: A Strategic Approach to Collaborative and Problem-Based Learning

The Intention

Collaborative learning is generally characterized by students working in groups in some sort of learning activity. The basic concept is that they will be able to help each other learn better than if they were to study alone. One dilemma for the instructor is that collaborative learning requires group participation but individual accountability on the part of the student. Students who come to group activities prepared to discuss the topic, or engage in the activities are going to be able to contribute more than students who do not prepare.

So, how do you encourage students to come prepared? The answer is to grade both group performance and individual performance. In Michaelsen's (2002) book, Team Based Learning, he suggests a method where the students study the material outside of class. (*Michaelsen suggests you use the term team as opposed to group. Teams stay together and are permanent. Teams suggest a sense of purpose and direction.*)

When the students get to class, they take, as individuals, a readiness assessment test (RAT) over the material they were assigned to read. This is generally a multiple choice test over the reading content, which is collected when they finish. When everyone finishes, the pre-assigned group gets to-gether, and **they take the same test as a group**, discussing the possible answers, and making a group decision on the best answer. Here they get immediate feedback whether their answer was correct or incorrect. One technique for doing this is to use a scratch-off answer sheet called the **IFAT** (Immediate Feedback Assessment Technique) that allows the group to see if they got the answer correct on the first try (5 points), second try (3 points), or third try (1 point). Each group only gets one scratch-off sheet. The groups hand in their **IFAT** sheets which are scored and the group score is added to the individual score for the knowledge test.

Teams are now given a critical thinking task that has them apply the material to a problem that does not necessarily have a correct or incorrect answer. The teams can then present their answers and give a rationale for their solution. A website devoted to Team-based Learning can be found at the University of Oklahoma website.

There is some research evidence that this approach supports critical thinking (Gokhale, 1995). Gokhale found that individuals in teams working collaboratively did no better than individuals working alone on factual knowledge, but they were significantly better on problems requiring critical thinking.

The Activity

- Assign the students to diverse (heterogeneous) teams of five to seven.

- Have a practice reading and readiness assessment test (RAT) session, so students understand the procedure.

- Have them decide how their grades will be determined (see Michaelsen).

- Divide the course into five or six units (two to three text chapters) – each to be initiated with a readiness assessment test (RAT).

- Prepare out-of-class assignments for the course.

- Prepare five questions over the reading that assesses the student's knowledge of what the reading said – this is the readiness assessment test (RAT).

- Prepare one or two "critical thinking" questions for each unit that take the reader into interpreting what it was the content implies – if you can come up with multiple plausible options, so much the better.

- At the start of each unit give the five-question RAT – collect the individual papers.

- Have teams of three to five students convene and take the RAT again as a group – hand it in for a group score or use the Immediate Feedback Assessment Test (IFAT).

- Let the groups discuss the critical assessment questions until they have a group response then have all the groups explain their responses. Students at this point may challenge items on the test.

- Debrief the assignment, giving everyone feedback about their responses, and elaborate on the topic being taught.

Case Studies

The Intention

Gleaned from real life, cases can help students explore the use of theory in practice. Students will learn to analyze, articulate their point of view, listen to others, bring about consensus, summarize, and then present their findings in several formats.

The Activity

- Cases must be found or written that relate to your learning objectives.

- After being assigned for students to read, cases can be used in several ways:

Class Discussions

- As always, you should begin the first use of case studies with guidelines for constructive discussion and criticism of other's ideas.

- Begin by providing students with questions they can use to examine the case; after studying one case, students can use the case as a model on how to proceed with other case studies.

Debates

- Many cases describe circumstances that will lead to a decision. Often there is not a "correct" decision. This type of environment is the perfect setting for debate.

- Use groups to debate the sides (there may be more than two) of the issue.

- Set up observers as judges and instruct them. Set other observers as timers.

- To make observers even more active, ask them to add additional points to the debate that were not covered.

Class Discussions

The Intention

Discussions provide opportunities for students to demonstrate their knowledge of what they are learning in the classroom, as well as allowing for clarification, questions, and expressions of opinion. As the instructor, you can provide immediate feedback and correct misunderstandings. Discussions can be used to:

- Help students learn to identify and evaluate the logic and evidence that forms the basis of their own and others' positions.

- Give students opportunities to formulate applications of principles.

- Help students identify and formulate problems using information gained in reading or lectures.

- Use the resources of members of the group.

- Help students learn to think in ways that are particular to the discipline.

- Gain acceptance for information or theories counter to previous beliefs of students.

- Get prompt feedback on how well objectives are being accomplished.

The Activity

Open-ended discussion

If the objective is to promote critical thinking, curiosity about the topic, or tolerance for opposing viewpoints, open-ended discussions are most appropriate.

- Use broad questions to get the discussion started, but students formulate the majority of questions and have more control of the discussion.

- Allow ample time for all students to respond and encourage a lateral rather than teacher-directed response pattern.

- Mediate the responses, reinforce learning, and redirect questions based on misconceptions.

Suggestions for Successful Discussions

Planning

- In your syllabus, emphasize that discussion will be an important **part of the course**.

- Define the **criteria for receiving full credit** for class participation, including such items as "integration of class experiences and materials, the development of pertinent ideas, insights, or points of view, the sharing of exemplary experiences, asking of crucial questions, or building on provocative points made by others" (Barnes-McConnell, 1978, p. 67).

- Define **clear objectives** for the discussion.

- **Schedule a discussion** a few weeks into the semester. By then you may know who can be called on to take a stand, summarize, clarify, or be used to move the discussion along.

Initiating

- Develop a **strategy for beginning** the discussion or re-starting it should it bog down: Will you call on a particular student to begin the process or ask for a volunteer? (The larger the class, the more likely it is that participation will have to be encouraged by calling on students.)

- Start with a **common experience, a question, or a controversy**. You might provide a concrete, common experience through a demonstration, film, or role-playing.

- Ask a relatively open question such as, "What are your immediate reactions to...?"

- A good way to pose a controversial issue is to first ask by a show of hands how many students take one side or the other.

- 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.

- Play devil's advocate when a class comes too quickly to agreement on a complex issue. But always debrief students when the discussion is over on the reasons why you took the opposing position.

- Offer an example if the problem you have posed appears too abstract. "Let me describe an example of how. . . "

- Allow sufficient wait time. Wait at least 10 seconds before rephrasing the question. Research indicates instructors rarely wait long enough for students to think and formulate their responses.

- Know the material. Be ready to deal with nuances and unexpected new interpretations and perspectives from the students. Decide the important facts, concepts, formulas, relationships, chronology, and figures that will shape the discussion.

Guiding

- As the class discusses, put items on the board or overhead transparency.

- Arrange the responses in a way that demonstrates relationships, depth, and possible contradictions (perhaps by developing a concept map). Write only what you want the students to recall of the discussion.

- Think of questions that promote discussion, not answers. Some questions should promote discussion of the "big picture" while others should probe each aspect of the concepts.

- Listen to the answer, to both the words and to the subtext of what the student is trying to convey. If the first answer does not address the issue at hand, ask a question that will direct students to think in a different way.

- Give and take control. There will be times when you need to control the direction of the discussion or to diffuse inappropriate remarks. At other times, the discussion must be allowed to flow without any overt control. A hearty discussion may not flow linearly, but as long as the essential points are addressed, do not impose rigidity.

- Move around, going closer to students who are speaking, moving toward students who are not participating to bring them into the discussion. Move away from those who try to dominate.

- Ask for responses in writing. To get discussions going, ask students to respond to a question in writing. Usually five minutes is enough. Encourage them to be creative by using the writing as a chance to brainstorm. Then invite oral responses. Often quiet students will speak up if they have the words before them. Also, written responses often lead to more reflective discussions.

Addressing Common Problems

- Ask for **responses in writing**. To get discussions going, ask students to respond to a question in writing. Usually five minutes is enough. Encourage them to be creative by using the writing as a chance to brainstorm. Then invite oral responses. Often quiet students will speak up if they have the words before them. Also, written responses often lead to more reflective discussions.

- Moderate the **student who talks too much**. Avoid looking in the direction of the student, as if inviting him or her to answer, even when no one else is responding. Try "Let's hear from someone who has not yet contributed." Another strategy is to raise the question of participation with the class, e.g., "Would the class be more effective if the participation were more evenly distributed?" You might also ask one or more members of the class to act as observers for a few class periods, reporting back to the class. Perhaps assigning the avid talker to the observer role would help sensitivity. Another technique is to talk to the student individually outside of class.

- Use reason to calm **the discussion that turns into an argument**. In good discussions conflicts will often arise. Here are some ways to resolve them:

  ◇ If the solution depends on certain **facts**, ask students to provide the authority.

◇ If there is an **experimentally verified answer**, use the opportunity to review the method by which the answer could be determined.

◇ If the question is one of **values**, use the occasion to help students become aware of the values involved.

◇ List **both sides of the argument** on the board.

◇ Take a **strong position as moderator**, preventing students from interrupting each other or speaking simultaneously. Lay ground rules for discussion, such as asking students to focus the conflict on ideas rather than on people and to resist being judgmental.

• **Help guide students who make unclear or hesitant comments.** Encourage students making unclear contributions to give examples or restate points for verification; encourage hesitant comments by enthusiastic nonverbal cues and patience.

• **Right the discussion that goes off track.** Stop and ask a student to summarize when the discussion appears to go off track. Help students isolate that turning point and suggest how it might be refocused on the issue at hand.

• **Postpone the student who attacks.** When a student argues for the sake of argument, an instructor will almost always lose if he takes the bait. This situation often occurs when an instructor is going over exams or assignments. Simply give the student some recognition while firmly moving on. Do not discuss the controversial issue in the classroom; instead, tell the student you will talk with him or her after class.

• **Redirect the student who tries to embarrass the instructor.** Students may try to gain authority or diminish your own through comments such as: "How do you really know that…?" or "You're not really saying that…?" Respond by redirecting the attack by saying: "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.

Concluding the Discussion

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

Adapted with permission from *Teaching at The Ohio State University:* A Handbook, Center for Teaching Excellence.

Questioning Sessions

The Intention

Using Socratic questioning techniques to proceed through a lecture, a problem solving session, a demonstration, or simply as a stand-alone can be an effective active learning technique. Students learn to process concepts and information and to articulate that knowledge. Whether the questioning session works depends on how you ask, phrase, and pose the questions.

The Activity

Forming questions

To reach the higher levels, you will have to ask question that go beyond recall.

Comprehension:	Retell
Application:	How is … an example of…? How is … related to…?
Analysis:	What are the parts of …? How would you compare/contrast … ? What evidence is there for…?
Synthesis:	What do you predict/infer…? How would you create/design…? What would the result be if you combined…?
Evaluation:	What are your points of agreement/ disagreement and why? What criteria would you use to …?

Even when you pitch your questions at a particular level your students may not answer at the same level. Restating your question while emphasizing the type of answer expected might lead students to begin thinking at higher levels. Once again, when students understand what is expected they will perform better.

More recommendations for questioning

- Focus questions on learning objectives.
- Phrase questions clearly and specifically.
- Ask questions geared to the level of students.
- Keep questions in sequence.
- Ask questions at different cognitive levels.
- Follow up on student responses.
- Give students time to formulate responses.
- Use questions that invite wide participation.

Examples of open-ended questions

- Why is there an energy crisis?
- What are some of the reasons we don't use more solar energy to reduce our dependence on oil?
- How does this relate to theories of diffusion and adoption of innovation?
- Given the medical data before you, how would you go about diagnosing this patient's problem?
- Does anyone have a comment on X's response?

*Bonwell, C. C., & Eison, J. A. (1991). *Active learning: Creating excitement in the classroom.* ASHE-ERIC Higher Education Report, No.1. Washington, DC: George Washington University, School of Education and Human Development

Additional Active Learning Activities

Writing

- **One-minute papers**

  Ask students to write on something they should have learned in class that day, something that is still not clear, questions they have, the main point of the lecture, critiques of the ideas being presented, or the part of class that helped them learn more. This can also be an alternative to calling or checking roll so the time is a trade-off.

  ◇ At the beginning or end (or even in the middle) of class, ask students to submit a one-minute paper.

  ◇ To limit the size of the responses in large classes, ask students to write their responses on a 3x5 card.

  ◇ You or the students can provide feedback during the next class to selected questions.

- **Research summaries or abstracts**

  Much shorter than a research paper (perhaps one page), this method can still get the student to do the research.

  ◇ Ask students to write a summary, analysis, and/or

  their reflections of a particular research article.

  ▪ These may be exchanged among students and a consensus reached for submission to the professor.

- **Keeping a journal**

  Some successful journal activities have students relate theory to practice, concepts to reality, or show evidence of their learning, individual insights and questions about course material.

  ◇ Before you ask students to keep a journal, plan specifically what should be in their journals.

  ◇ Provide feedback at least three times a semester.

  ◇ Be selective in the reading of journal entries.

  ◇ Ask students to organize and mark entries that you will read.

  ◇ Or ask them to select their best entry and mark it for you to read.

- **"How to" piece**

  Have students describe a solution to a problem. This can help students slow down and organize steps to accomplish something, analyze the relationship between steps, and begin to critique their own way of telling. This method can help in mathematics, sciences, or business to include those students whose writing skills may be better than their skills in these other areas.

  ◇ Ask students to write complete instructions about "How to…"

♦ Give one student's instructions to another student and ask him or her to follow the instructions as written.

♦ Let the class decide if adequate instructions were given.

Visual-based Learning

Outlining, flow charts, webs, and concept maps

Charts, diagrams, webs, maps, as well as pictures, can be used as visual examples of abstract concepts. Concept maps, in particular, are concerned with relationships among ideas. They help students decide the important points and how they relate to each other.

- Ask students, individually or as groups, to develop one of these visual structures.

- Members of groups can be asked to come to a consensus and present one form to the class.

- These can also be shared, discussed, and synthesized into one in class.

Lecturing

Intentional errors

- Make an intentional error in class. You can usually make the error that is commonly made by students.

- Continue into absurdity until students question and correct you.

Collaborative Learning

- **Collaborative writing**

  ♦ A collaborative writing assignment can be organized in several ways. Try to avoid giving one person all the work. One example might be to get a group to break down a writing assignment into parts; each student writes his or her part and then brings it to the group for compilation and editing.

Resources for Active Learning

The following is just a sampling of resources you can find on Active Learning. An Internet search of Active Learning will return thousands of references. Use the resources listed here to get you started in your search.

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