

Effective Teaching Moves for Six Learning Outcomes

(Bloom's Cognitive Operations)

KNOWLEDGE

To memorize or recognize facts and terms

For You to Do	For Students to Do
<ul style="list-style-type: none"> • Suggest prior knowledge to which students can link new and future information and knowledge. • Chunk knowledge into coherent groups, categories, or themes. • Share devices to improve memory such as mnemonic patterns, maps, charts, comparisons, groupings, highlighting of key words or first letters, visual images, and rhymes. • Point out parts, main ideas, patterns, and relationships within sets of facts or information. 	<ul style="list-style-type: none"> • Practice recalling and restating information. • Practice recognizing or identifying information. • Practice recalling and reproducing information. • Practice restating concept definitions and principles.

COMPREHENSION

To translate, restate in one's own words

For You to Do	For Students to Do
<ul style="list-style-type: none"> • Outline new or upcoming material in simple form. • Concept-map new or upcoming material. • Explain with concrete examples, metaphors, questions and/or visual representations 	<ul style="list-style-type: none"> • Restate/paraphrase and summarize information or knowledge. • Describe or explain phenomena or concepts using words different from those used in the initial teaching. • Identify the correct meaning of concepts or terms. • Add details or explanations to basic content. • Relate new to previously learned content. • Construct visual representations of main ideas (mind or concept maps, matrices, flow charts, graphs, diagrams, or pictures).

APPLICATION

To utilize, apply, make useful

For You to Do	For Students to Do
<ul style="list-style-type: none"> • Give multiple examples of a phenomenon that are meaningful to students. • Define the procedures for use, including the rules, principles, and steps. • Provide the vocabulary and concepts related to procedures. • Explain steps as they are applied. • Define the contexts, problems, situations, or goals for which given procedures are appropriate. • Explain the reasons that procedures work for different types of situations or goals. • Assure students' readiness by diagnosing and strengthening their command of related concepts, rules, and decision-making skills. • Provide broad problem-solving methods and models. • Begin with simple, highly structured problems, then gradually move to more complex, less structured ones. • Use questions to guide student thinking about problem components, goals, and issues. • Give students guidance in observing and gathering information, asking appropriate questions, and generating solutions. 	<ul style="list-style-type: none"> • Generate new examples and non-examples. • Paraphrase the procedures, principles, rules, and steps for using or applying the material. • Practice applying the material to problems or situations to gain speed, consistency, and ease in following the problem-solving steps. • Practice choosing the types of problem-solving strategies for different situations. • Solve simple, structured problems, then complex, unstructured ones. • Practice recognizing the correct use of procedures, principles, rules, and steps with routine problems, then complex ones. • Demonstrate the correct use of procedures, principles, rules, and steps with routine problems, then complex ones.

ANALYSIS

To identify and examine components, compare and contrast, identify assumptions, deduce implications

For You to Do	For Students to Do
<ul style="list-style-type: none"> • Point out the important and the unimportant features or ideas. • Point out examples and non-examples of a concept, highlighting similarities and differences. • Give a wide range of examples, increasing their complexity over time. • Emphasize the relationships among concepts. • Explain different types of thinking strategies, including how to think open-mindedly, responsibly, and accurately. 	<ul style="list-style-type: none"> • Classify concepts, examples, or phenomena into correct categories. • Summarize different types of thinking strategies. • Use types of thinking strategies to analyze and evaluate their own thinking. • Practice choosing the best type of thinking strategy to use in different real-world situations, and explaining why their choice is superior. • Detect and identify flaws and fallacies in thinking.

<ul style="list-style-type: none"> • Emphasize persistence when answers are not apparent. • Ask students questions that require their persistence in discovering and analyzing data or information. • Encourage students to self-evaluate and reflect on their learning. • Ask questions that make students explain <i>why</i> they are doing what they are doing. • Explain and model how to conduct systematic inquiry, detect flaws and fallacies in thinking, and adjust patterns of thinking. 	<ul style="list-style-type: none"> • Identify and explain instances of open- and closed-mindedness. • Identify and explain instances of responsible versus irresponsible and accurate versus inaccurate applications of thinking strategies. • Answer questions that require persistence in discovering and/or analyzing data or information.
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SYNTHESIS

To make connections, identify new relationships, design something new (new to students)

For You to Do	For Students to Do
<ul style="list-style-type: none"> • Promote careful observation, analysis, description, and definition. • Explain the process and methods of scientific inquiry. • Explain and provide examples of (a) how to identify a research problem, (b) how to speculate about causes, (c) how to formulate testable hypotheses, and (d) how to identify and interpret results and consequences. • Model inquiry and discovery processes. • Encourage independent thinking and avoiding dead ends and simplistic answers. • Show students examples of creativity and “thinking outside the box” to solve problems. • Encourage students to take novel approaches to situations and problems. • Explain phenomena using metaphors and analogies. • Give students examples of reframing a problem—turning it upside down or inside out or changing perceptions about it. • Explain and encourage brainstorming. • Pose questions and problems with multiple good answers or solutions. • Give students opportunities for ungraded creative performance and behavior. 	<ul style="list-style-type: none"> • Explain their experiences with inquiry activities and the results. • Resolve a situation or solve a problem that requires speculation, inquiry, and hypothesis formation. • Resolve a situation or solve a problem requiring a novel approach. • Design a research study to resolve conflicting finding. • Write the limitations section of a research study. • Write the conclusions section of a research study. • Develop products or solutions to fit within particular functions and resources. • Manipulate concrete data to solve challenging thinking situations. • Practice reframing a problem—turning it upside down or inside out or changing perceptions about it. • Explain phenomena using metaphors and analogies.

EVALUATION

To make a judgment, assess validity, select and defend

For You to Do	For Students to Do
<ul style="list-style-type: none"> • Create conflict or perplexity by posing paradoxes, dilemmas, or other situations to challenge students' concepts, beliefs, ideas, and attitudes. • Explain how to recognize and generate proof, logic, argument, and criteria for judgments. • Explain and show students the consequences of choices, actions, or behaviors. • Provide relevant human or social models that portray the desired choices, actions, or behaviors. • Explain with examples how factors—such as culture, experience, desires, interests, and passions, as well as systematic thinking—influence choice and interpretations. 	<ul style="list-style-type: none"> • Evaluate the validity of given information, results, or conclusions. • Draw inferences from observations and make predictions from limited information. • Explain how they form new judgments and how and why their current judgments differ from their previous ones. • Identify factors that influence choice and interpretations, such as culture, experience, desires, interests, and passions, as well as systematic thinking. • Detect mistakes, false analogies, relevant versus irrelevant issues, contradictions, and faulty predictions. • Critique a research study. • Use research and analysis to devise the best available solutions to problems, and explain why they are the best. • Choose among possible behaviors, perspectives, or approaches, and provide justifications for these choices.

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Skillful Discussion Management for Broad, Active Participation

Explain Civil Discourse and Set Ground Rules.

Ready the Class and Ignite the Exchange.

- Put up a written outline/road map for the discussion/class period.
- Start out by asking students to summarize the previous class.
- Start out with a few recall questions on the readings.
- Start out by asking for students' emotional reactions to the readings.
- Start out with a reference to a well-known current event or an experience from your previous class, such as a video, demonstration, or role play.
- Start out with a highly controversial question.
- Start out by having students read aloud important text passages (rather than you doing it).
- Start out with a writing prompt—that is, a reading-relevant question or provocative statement that students can reflect on and write about for a few minutes.
- Start out by having students brainstorm what they already know about a topic or what outcomes they anticipate of a situation or an experiment.
- Start out by taking the role of devil's advocate and arguing in favor of a position that you know that some students will argue against. As a few students may interpret your representing "the devil" as manipulative, untrustworthy, and confusing, explain what you're doing beforehand. While assuming the role, you might even wear a hat or a sign with "Devil's Advocate" written prominently on it.

Lower Social Barriers, Reduce Shyness, and Provide "Security Blankets."

- Arrange seats in a circle.
- Have icebreakers the first day of class.
- Have students fill out index cards the first day, letting them share any information they'd like about their student and personal lives.
- Call students by name.
- Help students learn their classmates' names; use name tags or tents.
- Casually chat with students before and after class.
- Get to know students through office hour appointments. (Frequently pass around a sign-up sheet.)
- Make eye contact with all students.
- Establish physical proximity with all students by sitting in different places and moving around the room.
- Have students read aloud important text passages (instead of your doing it).
- Refer back to the previous contributions of students (by name) during discussions.

- Frequently break your class into small groups to solve problems and answer complex questions.
- Extend students' participation by having them post to a class blog, wiki, discussion board, or chat.
- Have students jot down answers to complex questions before calling on anyone.
- Direct some questions to quieter sectors of the room and to quieter individuals.
- See quiet students in your office hours and ask them why they haven't participated; they may be dealing with a major emotional problem. Still, encourage them to become involved. You might give them one or more discussion questions in advance of the next class and let them rehearse their answers with you.

Motivate Students to Prepare to Participate.

- Include participation in the course grade (10% to 30% or as bonus points).
- Distribute study guide questions on the readings.
- Have a random-selection "calling-on" policy. This technique works especially well when you provide study questions on the readings in advance.
- Use reading compliance and comprehension strategies, such as requiring students to take reading notes, write answers to study guide questions, or submit written questions on readings; or giving daily quizzes on the readings; or setting up in-class games or simulations that require doing the readings to do well.
- Allow students to use their reading notes, answers to study questions, and the like to answer the discussion questions.
- Have students mark passages in the readings that are puzzling to them, especially important, or related to other readings or discussion themes, and then read them aloud in class and explain why they selected them. After all the students have shared their passages, each in turn responds to classmates' choices and insights, recounting what they have found most meaningful, interesting, or novel.

Motivate Students to Pay Attention.

- Advise students on how to take notes on discussion.
- Advise them specifically *when* to take notes.
- Refer frequently to your discussion outline/road map.
- Write the major points made on the board.
- Include the content of discussions in assignments and exams (and say you will do this).
- Ask students to comment on and react to one another's contributions.
- In small-group discussions, randomly select a few groups to summarize their progress, answers, conclusions, and so on, and within each group randomly select the spokesperson.
- Regularly select a student to summarize the discussion at the end of class; then invite other students to add major points.
- End class with a *minute paper* (budget 2 to 3 minutes)—that is, ask students to write down anonymously (1) the most important things they learned during the class and (2) any

questions or points they found the most confusing. Do collect these to ensure students do them, and sample a few to see how students experienced the class.

Pause and Wait for Responses.

- Ask only one question at a time.
- Allow sufficient time for students to respond—5 to 15 seconds, depending on the difficulty of the challenge.
- If the question/task is very challenging, give students time to jot down responses or formulate them with a neighboring peer or group.

Moderate to Maintain Momentum

- Before commenting on an answer yourself, ask other students to react to their peers' contributions.
- Ask students to address comments directly to one another.
- Ask students to help you clarify points.
- If the class is splitting into camps on an issue, set up a spontaneous debate, allowing students to change their mind as it progresses. For a twist, have each side argue in favor of the opposition.
- Step in, preferably with a thoughtful follow-up question, only if no student supplies the needed clarification, correction, or knowledge or if the discussion strays off track.
- Be sure a topic is settled before moving on. Ask if anyone has something to add or qualify.
- Ask a student to summarize the main points made during the discussion of the topic. Then move on, making a logical transition to the next topic.

Respond Honestly to Student Responses.

- *When the answer is correct*, praise according to what it deserves.
- *When the answer is correct but is only one of several correct possibilities*, ask another student to extend or add to it. Or frame a question that is an extension of the answer. Avoid premature closure.
- *When the answer is incomplete*, follow up with a question that directs the student to include more—for example, “How might you modify your answer if you took into account the _____ aspect?”
- *When the answer is unclear*, try to rephrase it, and ask the student if this is what she means.
- *When the answer is seemingly wrong*, follow up with one or more gently delivered Socratic questions designed to lead the student to discover his error—for example, “Yes, but if you come to that conclusion, don't you also have to assume _____?”
- Vary your response to faulty answers so students simply don't translate a stock phrase as, “You're wrong.”
- Avoid identifying and correcting errors yourself for as long as possible.