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QuickAnswers

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Q: How can I Better Teach Critical Thinking Skills?

A: Learn to Use the 10 Key Components of an Effective Critical Thinking Skills Lesson

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The ideal goal of classroom teaching is to encourage content learning that can be applied and retained well into the student's lifetime.

Ample educational research confirms the notion that college students need to engage in critical thinking to promote long-term content retention.[1] It's particularly important for students in career-track courses in which the content is directly applicable to their future profession.[2]

Case studies are a natural means of integrating effective critical thinking into college teaching.[3]

Critical Thinking Basics

In 1605, Francis Bacon described critical thinking as a "desire to seek, patience to doubt, fondness to meditate, slowness to assert, readiness to consider, carefulness to dispose and set in order; and hatred for every kind of imposture."

Even though it captures the essence of critical thinking, this description has little utility as a guide for incorporating critical thinking into the classroom. In a classroom application, critical thinking is best defined as exploring questions about and solutions for issues that are not clearly defined and for which there are no clear-cut answers. It reflects real-world problem-solving situations that cannot be answered as if the problem were a multiple-choice, rote-memory question.

Key components of a critical thinking lesson:

- Teaching objectives relevant to the course content
- Purpose and goal for the thinking activity
- Realistic question or issue making up the problem
- Pertinent concepts such as axioms, definitions, laws, models, principles, and theories
- Major assumptions likely to be presupposed in the situation
- Information such as data, experiences, facts, and observations
- Interpretations and inferences that lead to conclusions and solutions
- Various points of view underlying the problem
- Consequences and implications to different solutions
- Assessment based on the use of assumptions and concepts

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Major Design Elements

A properly designed critical thinking activity has two major building blocks: (1) it identifies a set of skills for processing and generating information and beliefs, and (2) it relies on the intellectual commitment of the student using those skills to guide their decision-making behavior.

Critical thinking activities require students to follow a scenario sequenced on the steps of Bloom's taxonomies of cognitive and affective learning. Cognitive learning deals with mental skills, whereas affective learning involves attitudes and moral decision-making.[4]

In cognitive learning, critical thinking engages students in activities in which they analyze, synthesize, and evaluate knowledge, comprehension, and applications of principles learned in a class.

Key Cognitive Outcomes

The following outcome list is associated with Bloom's cognitive learning skills:[5]

Knowledge: Count, Define, Describe, Draw, Find, Identify, Label, List, Match, Name, Quote, Recall, Recite, Sequence, Tell, Write

Comprehension: Conclude, Demonstrate, Discuss, Explain, Generalize, Identify, Illustrate, Interpret, Paraphrase, Predict, Report, Restate, Review, Summarize, Tell

Application: Apply, Change, Choose, Compute, Dramatize, Interview, Prepare, Produce, Role-play, Select, Show, Transfer, Use

Analysis: Analyze, Characterize, Classify, Compare, Contrast, Debate, Deduce, Diagram, Differentiate, Discriminate, Distinguish, Examine, Outline, Relate, Research, Separate

Synthesis: Compose, Construct, Create, Design, Develop, Integrate, Invent, Make, Organize, Perform, Plan, Produce, Propose, Rewrite

Evaluation: Appraise, Argue, Assess, Choose, Conclude, Critique, Decide, Evaluate, Judge, Justify, Predict, Prioritize, Prove, Rank, Rate, Select

What About Affective Learning?

Affective learning has students value, organize, and internalize emotional phenomena. The educational outcomes for affective learning are based on a personal choice or action that the student is expected to use to resolve the issue.

This area is best measured using student self-assessment to evaluate the standards or outcomes.

Any evaluation must recognize that choices are often relative to the situation. And frequently the situation under which the behavior is expected must be justified by the student.

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Case Studies Basics

Cases studies add a cooperative active learning component to critical activities. Active learning is the process of analyzing, communicating, and exploring new information or experiences. It also incorporates the analytical thinking skills essential for critical thinking activities. Analytical thinking involves separating and distinguishing the crucial elements of a concept in order to understand its essential nature.

A case study is best defined as an analytical exploration of one particular situation or subject for the purpose of gaining depth of understanding into the issues being investigated.[6]

Case studies can be assigned to students as individual or collaborative group projects. They can be administered as an in-class project or as a take-home assignment.

A typical case study format:

- Introductory discussion that leads into a specific problem
- Preparation expected of students
- Opening questions
- Time for discussing or researching the issues
- Concepts to be applied and extracted in discussion or research
- A means for students to express their conclusions for the case
- Student self-evaluation
- Summative evaluation by faculty

Optimizing the Case Study Approach

An effective case study problem must first engage students' interest and motivate them to probe for deeper understanding of the concepts being introduced. In addition, it should relate the subject to the real world, so that students have a stake in solving the problem.

Good case problems require students to make decisions or judgments based on facts, information, logic and/or rationalization. Students should be required to justify all decisions and reasoning based on the principles being learned. Problems should require students to define what assumptions are needed (and why), what information is relevant, and/or what steps or procedures are required to solve them.

Length Considerations

The length and complexity of the problem or case must be controlled so that students realize that a "divide and conquer" effort will not be an effective problem-solving strategy.

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For example, a problem that consists of a series of straightforward end-of-chapter questions will be divided by the group and assigned to individuals and then reassembled for the assignment submission. The case should be open-ended and complex enough so that "tough decisions" must be made and there is no immediately obvious answer.

Need Case Study Ideas?

The National Center for Case Studies Teaching in Science website has a wonderful links page for collecting examples of case studies for the different disciplines: http://ublib.buffalo.edu/libraries/projects/cases/sites.htm.

Many of the science case studies on this web site are also applicable to education, political science, psychology, and sociology courses.

Other good case studies websites are hosted by Vanderbilt University (http://www.vanderbilt.edu/cft/resources/teaching_resources/activities/case_studies.htm) and Pennsylvania State University (http://tlt.psu.edu/suggestions/cases/).

Good News Results

Critical thinking using case studies forms the pedagogical foundation for students in many courses at Lone Star College–Kingwood. Pre- and post-test studies were conducted in the Biology Department on classes taught with and without case studies. These studies show that case studies improve student grades on traditional concept testing.

In addition, there is an increase in course attendance and in overall course grade. Faculty indicated a higher degree of satisfaction with their students and teaching when using case studies to reinforce difficult concepts.

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