Questions That Promote Deeper Thinking

Surveys of college faculty reveal that their number one instructional goal is to promote critical thinking, and reports on the status of American higher education have consistently called for greater emphasis on the development of college students' critical thinking skills. Definitions of critical thinking range from the narrow ("a well-reasoned evaluative judgment") to the broad ("all thinking that involves more than the mere acquisition and recall of factual information").

A more inclusive definition of critical thinking embraces all thought processes that are "deeper" than memorization and recall of factual information. When students think critically, they think deeply; they not only know the facts, but they take the additional step of going beyond the facts to do something with them. Critical thinking involves:

- reflecting on the information received
- moving away from "surface" memorization and toward deeper levels of learning
- a shift away from viewing learning as the receiving of information from teacher or text to a transformation of received information into a different form by the learner
- incorporates evaluation

To combat the prevalent student misconception that critical thinking means being "being critical," some use the term "deep thinking" skills.

The following can be used as a guide by instructors to develop teaching strategies that intentionally promote the development of critical thinking skills and by students to assess whether they are engaging in effective critical thinking when speaking, writing, or studying. Each of the critical thinking skills is defined in terms of a corresponding mental action and is followed by a trio of sample questions designed to promote that particular form of thinking and can be adapted for use in specific courses.

1. "Open-ended" questions intentionally designed to provoke divergent thinking

Some college instructors spend little class time posing questions to students, or when questions are posed, many are memory-level questions that ask for factual recall, the least likely to promote student involvement. In contrast, "open-ended" questions calling for divergent thinking (i.e., questions that allow for a variety of possible answers and encourage students to think at a deeper level) are more effective in eliciting student responses than "closed" questions calling for convergent thinking (i.e., questions that require students to narrow-in or converge on one, and only one, correct answer).

Insert open-ended, divergent-thinking questions into your lecture notes as a reminder to pose them at certain points in class, for general class or small group discussion. Students may be asked to write a minute-paper in response to the question. Or students may write a minute paper first and then discuss their written responses, allowing the more reflective students time to gather their thoughts prior to verbalizing them and those self-conscious about public speaking a script to use as a support for communicating their ideas orally.

Students can also learn to generate their own higher-level thinking questions. Using a technique called "guided peer questioning," students are first provided with a series of generic question

stems that serve as cognitive prompts to trigger or stimulate different forms of critical thinking:
(a) "What are the implications of _____?"
(b) "Why is _____ important?"
(c) "What is another way to look at _____?"

2. Questions that ask students to reflect on their own thinking processes and to identify what particular form of critical thinking they are using

After students have communicated their ideas, either orally in group discussions or in writing with minute papers, they may be asked to reflect on what type of critical thinking the question was designed to promote and whether they think they demonstrated that critical thinking in their response.

One distinguishing characteristic of high-achieving college students is that they tend to reflect on their thought processes during learning and are aware of the cognitive strategies they use. Students can learn to engage in such "meta-cognition" (thinking about thinking) if they are regularly asked self-assessment questions, which require reflection on their own thought processes. When students learn to routinely ask themselves these questions, the depth and quality of their thinking are enhanced.

Classification of Critical Thinking Skills

1. **Comprehension** (Understanding): to convert information into a form that is p**ersonally meaningful**, i.e., that *makes sense* to the *individual* who is learning it.

- How would you put _____ into your own words? (Paraphrasing)
- What would be an example of _____? (Illustrating)
- How would you translate _____ into visual form? (Concept-Mapping)

2. **Application**: to apply *abstract* or *theoretical* principles to **concrete**, **practical** situations.

- How can you make use of _____?
- How could _____ be put into practice?
- How would _____ be converted into an action plan?

3. **Analysis**: to **break down** or **dissect** information into its component *parts* in order to detect the relationship among the parts or the relationship between the parts and the whole. (For example, identify the underlying causes or sources of disagreement during a class discussion.)

- What are the most important/significant ideas or elements of _____? (Prioritization)
- What assumptions/biases underlie or are hidden within _____? (Deconstruction)
- What parts of _____ would be similar to/different than _____? (Comparison-and-Contrast)

4. **Synthesis**: to **build up** or **connect** separate pieces of information to form a larger, more coherent pattern. (For example, connect related ideas discussed in separate sections or units of a course into a single, unified product, such as a concept map; integrate ethical concepts learned in a course and philosophy with marketing concepts learned in a business course to produce a set of ethical guidelines for business marketing and advertising practices.)

- How can this idea be combined with _____ to create a more compete or comprehensive understanding of _____? (Integration)
- How can these different ideas be grouped together into a more general category? (Classification)
- How can these separate _____ be reorganized or rearranged to produce a more comprehensive understanding of the "big picture?"

5. **Evaluation**: to *critically* **judge** the validity (truth), morality (ethics), or aesthetic (artistic) value of ideas, data, or products by using relevant assessment criteria (standards for judging quality).

- How would you judge the accuracy or validity of _____?
- How would you evaluate the ethical (moral) implications or consequences of _____?
- How would you rate the aesthetic quality (beauty) of _____?

6. **Deduction**: to draw conclusions about **particular instances** that are logically consistent with or derive from general principles and premises.

- What specific conclusions can be drawn from this general _____?
- If this general _____ were true, then it would logically follow that _____.
- What particular actions or practices would be consistent with this general _____?

7. **Induction**: to infer (derive or draw out) well-reasoned **generalizations** or **principles** from individual instances or specific examples. (For example, identify recurrent themes or categories that emerge during a class discussion.) One form is the ability to abstract and extrapolate a concept learned in one context and transfer that learning to another context, a cognitive process often referred to as "decontextualization." This capacity to transfer knowledge, i.e., to apply a concept learned in one context to different contexts than the one in which the concept was originally learned, is often presumed to be the litmus test of whether a student has really (deeply) learned the concept or has simply memorized it in its original form, for example, the ability to solve different versions of math problems that require comprehension of the same underlying mathematical concept.

- What are the broader implications of _____?
- What patterns or themes emerge from _____?
- What can be extrapolated or extended from this particular _____ that may have more general or universal value?

8. **Adduction**: to make a *case* **for** an argument or position by accumulating *supporting evidence* in the form of logical arguments (*rational* thinking) or research evidence (*empirical* reasoning).

- What proof exists for _____?
- What are logical arguments for _____?
- What research evidence supports _____?

9. **Refutation**: to make a *case* **against** an argument or position by accumulating contradictory evidence in the form of logical arguments (*rational* thinking) or research findings (*empirical* reasoning).

- What proof exists that _____ is false?
- What are logical arguments against _____?
- What research evidence contradicts _____?

10. **Balanced Thinking**: to carefully consider arguments/evidence **for** and **against** a particular position or viewpoint.
- What are the strengths/advantages and weaknesses/disadvantages of _____?
- What evidence supports and contradicts _____?
- What are arguments for and counterarguments against _____?

11. **Multiple Perspective-Taking**: to view an issue from a variety of **viewpoints**, **standpoints**, or **positions** in order to gain a more *comprehensive* and *holistic* understanding.
- How would people from different ethnic or racial groups view this _____?
- How would people from different socioeconomic backgrounds be affected by _____?
- How would people who differ in age or gender react to _____?

12. **Causal Reasoning**: to identify **cause-effect** relationships between different ideas or actions.
- How would you explain why _____ occurred?
- What is responsible for _____?
- How would _____ affect or influence _____?

13. **Ethical Reasoning**: to identify what is **morally right/ wrong** or **good/bad** about particular ideas, attitudes, or practices.
- What does _____say about a person's values?
- What are the moral implications of _____?
- Are the expressed or professed convictions of _____ consistent with actual commitments and observable actions?

14. **Creative Thinking**: to generate **imaginative** ideas, **unique** perspectives, **innovative** strategies, or **novel (alternative)** approaches to traditional practices. (Note: Although critical and creative thinking are often seen as separate cognitive skills, the latter is included because it does involve thought processes that are deeper or higher than memorization.)
- What might be a metaphor or analogy for _____?
- What could be invented to _____?
- What might happen if _____? (hypothetical reasoning)