

Critical Thinking

by Browne and Keeley (2007)

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Presented by Yoonsuck Choe

Asking the Right Questions

Critical thinking refers to:

- Awareness of a set of interrelated critical questions;
- Ability to ask and answer critical questions at appropriate times; and
- Desire to actively use the critical questions.

^aPreviously presented at Choe's lab meeting: January 18, 2007.

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Critical Questions

What they allow you to do:

- React critically to an essay or to evidence presented in a textbook, periodical, or on a web site;
- Judge the quality of a lecture or speech;
- Form an argument;
- Write an essay based on a reading assignment; or
- Participate in class.

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Learning: Sponge vs. Panning for Gold

- Absorb information like a sponge and become a puppet, or
- Use a question-asking, active attitude like in panning for gold (in the river).

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Are You Panning For Gold?

- Did I ask “why” someone wants me to believe something?
- Did I take notes as I thought about potential problems with what was being said?
- Did I evaluate what was being said?
- Did I form my own conclusion about the topic?

Panning for gold is “interactive”.

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Weak vs. Strong Critical Thinking

- Weak: Critical thinking to defend your current beliefs.
- Strong: Use the same skills to evaluate all claims and beliefs, **especially your own.**

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Panning for Gold: Asking Critical Questions

- What other people say cannot be taken whole-sale because often they may be based on sloppy arguments and unfounded claims.
- You need critical reading and listening skills to distinguish between clear vs. sloppy thinking.
- You must always be alert for such sloppyness, this you must be **active**, by constantly **asking questions.**

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The Critical Questions

- What are the issues and the conclusions?
- What are the reasons?
- Which words or phrases are ambiguous?
- What are the value conflicts and assumptions?
- What are the descriptive assumptions?
- Are there any fallacies in the reasoning?
- How good is the evidence?
- Are there rival causes?
- Are the statistics deceptive?
- What significant information is omitted?
- What reasonable conclusions are possible?

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Detecting Fallacies in Reasoning

- Personal attacks.
- Assuming a slippery slope, when there are measures to prevent it.
- Search for perfect solutions.
- Equivocation.
- Inappropriate appeal to common opinion.
- Appeals to questionable authority.
- Appeals to emotions.
- Attacks a straw person.
- Presents a faulty dilemma.
- Engages in wishful thinking.
- Explains by naming.
- Diverts attention from the issue.
- Distracts with glittering generalities.
- Begs the question.

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YC: Forming Your Own Opinions

- Ask questions, and evaluate your own questions. If your questions potentially lead to trivial answers, your question is not good.
 - Bad Example: “How can we increase the performance of task X?”
 - Good Example: “What is the nature of this problem X?”
- You cannot form your opinion from scratch. Learn from others:
 - Read book reviews: Positive vs. negative reviews – see how they differ in opinion. Reading the minority opinion helps you catch subtle points that are not apparent.
 - Read commentaries and responses in *Behavioral and Brain Sciences*, an open commentary journal.
 - Read review papers and “perspectives” in science journals.
- Search for fragments of your own vague thoughts: Search on google. Read. Identify statements that give you the “Aha!” feeling.
- **Write down your opinion, and debug it!**

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YC: Critical Questions

- What’s the main point of this paper?
- Does the research question itself make sense?
- What’s your evaluation of this paper?
 - What are the merits of the approach?
 - What are the limitations with this approach?
- How is this work related to other works?

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Keep Reading and Evaluating

- Ideas don’t just drop out of the sky. It grows on fragments of ideas you get from reading, reading, reading.
- Look for related material in related disciplines: Keep a broader perspective.
- Don’t blindly read: Evaluate as you read.
- Evaluate your own situation, and make corrective actions.
- Do all the above on a daily basis. Spend at least 30 minutes a day on reading no matter what: Don’t let daily chores be an excuse.

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References

Browne, M. N., and Keeley, S. M. (2007). *Asking the Right Questions: A Guide to Critical Thinking*. Upper Saddle River, NJ: Prentice Hall. 8th edition.