

How to Study and Learn (Part Three)

In the previous two articles we introduced some of the intellectual skills, abilities, and dispositions essential to the development of the educated person as articulated in our *Thinker's Guide for Students on How to Study and Learn*. All the ideas in this miniature guide are designed to help students think deeply through content and develop intellectually. In this article we focus on the analysis and evaluation of reasoning.

To analyze thinking, we focus on its parts. In other words, we focus on the purpose of thinking, the questions the thinking is pursuing, the information being used, the assumptions and inferences being made, the concepts and point of view guiding the thinking, and its implications.

To evaluate or assess thinking, we apply intellectual standards to the parts of thinking, standards such as clarity, accuracy, relevance, logic, precision, justifiability, significance, depth, and breadth. For example, we ask whether the purpose and question are clear, the information relevant and accurate, the inferences and implications logical, the assumptions and concepts justifiable, the point of view relevant.

When students can analyze and assess reasoning, they have skills essential to the educated person. In this column, we provide templates for students to use in analyzing and assessing reasoning in written form, the reasoning, for example, embedded in an article, essay, chapter, or textbook. Each of the sections in this column is written in the form of directions for students.

How to Analyze the Logic of An Article, Essay, or Chapter

One important skill for understanding an essay, article or chapter is through the analysis of the parts of the author's reasoning. Once you have done this, you can then evaluate the author's reasoning using intellectual standards. Here is a template to follow.

- 1) The main purpose of this article is _____. (Here you are trying to state as accurately as possible the author's purpose for writing the article. What was the author trying to accomplish?)
- 2) The key question that the author is addressing is _____ . (Your goal is to figure out the key question that was in the mind of the author when s/he wrote the article. In other words, What was the key question that the article addressed?)

- 3)** The most important information in this article is _____ . (You want to identify the key information the author used, or presupposed, in the article to support his/her main arguments. Here you are looking for facts, experiences, data the author is using to support her/his conclusions).
- 4)** The main inferences/conclusions in this article are _____. (You want to identify the most important conclusions that the author comes to and presents in the article).
- 5)** The key idea(s) we need to understand in this article is (are)_____. By these ideas the author means _____. (To identify these ideas, ask yourself: What are the most important ideas that you would have to understand in order to understand the author's line of reasoning? Then elaborate briefly what the author means by these ideas).
- 6)** The main assumption(s) underlying the author's thinking is (are)_____. (Ask yourself: What is the author taking for granted (that might be questioned). The assumptions are generalizations that the author does not think s/he has to defend in the context of writing the article, and they are usually unstated. This is where the author's thinking logically begins).
- 7)** If **a)** we take this line of reasoning seriously, the implications are _____. (What consequences are likely to follow if people take the author's line of reasoning seriously? Here you are to follow out the logical implications of the author's position. You should include implications that the author states, if you believe them to be logical, but you should do your best thinking to determine what you think the implications are.) If **b)** we fail to take this line of reasoning seriously, the implications are _____. (What consequences are likely to follow if people ignore the author's reasoning?)
- 8)** The main point(s) of view presented in this article is (are)_____. (The main question you are trying to answer here is: What is the author looking at, and how is s/he seeing it? For example, in this mini-guide we are looking at "education" and seeing it "as involving the development of intellectual skills." We are also looking at "learning" as "the responsibility of students.")

If you truly understand these structures as they interrelate in an article, essay, or chapter, you should be able to empathically role-play the thinking of the author. Remember, these are the 8 basic structures that define all thinking. They are the essential element of thought.

How To Figure Out the Logic of A Textbook

Just as you can understand an essay, article or chapter is by analyzing the parts of the author's reasoning, so can you figure out the system of interrelated ideas within a textbook by focusing on the parts of the author's reasoning within the textbook. To understand the parts of the textbook author's reasoning, use this template:

The Logic of a Textbook

1) The main purpose of this textbook is _____.
(Here you are trying to determine the author's purpose for writing the textbook. What was the author trying to accomplish?)

2) The key question(s) that the author is addressing in the textbook is _____.
(You are trying to figure out the key question that was in the mind of the author when s/he wrote the textbook, in other words, What was the key question which the textbook answers? Here, you might identify the broadest question the textbook answers, along with the most important sub questions it focuses on.)

3) The most important kinds of information in this textbook are _____.
(You want to identify the types of information the author uses in the textbook to support his/her main arguments {e.g. research results, observations, examples, experience, etc.}).

4) The main inferences/conclusions in this textbook are _____ (You want to identify the most important conclusions that the author comes to and presents in the textbook. Focus on this question: What are the most important conclusions that the author presents, conclusions that, if you understand them, shed important light on key beliefs in the field).

5) The key idea(s) we need to understand in this textbook is (are) _____. By these ideas the author means _____.
(To identify these ideas, ask yourself: What are the most important ideas that you would have to understand in order to understand the textbook? Then elaborate on precisely what the author means by these basic ideas. Begin with the most fundamental idea presented such as "science, biology, psychology, etc." These can usually be found in the first chapter. Then identify the other significant concepts that are deeply tied into the most fundamental one).

6) The main assumption(s) underlying the author's thinking is (are) _____. (Ask yourself: What is the author taking for granted (that might be questioned)? The assumptions are sometimes generalizations that the author does not think s/he has to defend in the context of writing the textbook.

The assumptions are sometimes stated in the first chapter as the key assumptions underlying the subject area).

7) a) If people take the textbook seriously, the implications are _____.

(What consequences are likely to follow if readers take the textbook seriously? Here you are to follow out the logical implications of the information/ideas in the textbook. You should include implications that the author argues for, if you believe them to be well-founded, but you should do your best thinking to determine what you think the implications are.)

b) If people fail to take the textbook seriously, the implications are _____. (What consequences are likely to follow if the author's thinking is ignored in a situation when it is relevant?)

8) The main point(s) of view presented in this article is (are) _____. (The main question you are trying to answer here is: What is the author looking at, and how is s/he seeing it? For example, the author might be looking at "science" and seeing it as "the most effective tool for better understanding the physical world and how it operates.")

How to Evaluate an Author's Reasoning

Once you have accurately identified the parts, or elements, of an author's reasoning you are then ready to assess those parts to determine the quality of the author's reasoning. Use the following guides to do so:

- 1.** Focusing on the author's Purpose: What is the purpose of the reasoner? Is the purpose well stated or clearly implied? Is it justifiable?
- 2.** Focusing on the key Question which the written piece answers: Is the question at issue well stated (or clearly implied)? Is it clear and unbiased? Does the expression of the question do justice to the complexity of the matter at issue? Are the question and purpose directly relevant to each other?
- 3.** Focusing on the most important Information presented by the author: Does the writer cite relevant evidence, experiences, and/or information essential to the issue? Is the information accurate and directly relevant to the question at issue? Does the writer address the complexities of the issue?
- 4.** Focusing on the most fundamental Concepts that are at the heart of the author's reasoning: Does the writer clarify key ideas when necessary? Are the ideas used justifiably?

5. Focusing on the author's Assumptions: Does the writer show a sensitivity to what he or she is taking for granted or assuming? (Insofar as those assumptions might reasonably be questioned?) Or does the writer use questionable assumptions without addressing problems inherent in those assumptions?
6. Focusing on the most important Inferences or conclusions in the written piece: Do the inferences and conclusions made by the author clearly follow from the information relevant to the issue, or does the author jump to unjustifiable conclusions? Does the author consider alternative conclusions where the issue is complex? In other words, does the author use a sound line of reasoning to come to logical conclusions, or can you identify flaws in the reasoning somewhere?
7. Focusing on the author's Point of View: Does the author show a sensitivity to alternative relevant points of view or lines of reasoning? Does s/he consider and respond to objections framed from other relevant points of view?
8. Focusing on Implications: Does the writer display a sensitivity to the implications and consequences of the position s/he is taking?

Conclusion

In this article, we have provided three templates useful in helping students practice analyzing and assessing reasoning. When we ask students to read an article, a chapter in a textbook, or a textbook as a whole, we should provide structures that enable them to understand and evaluate its basic logic. The templates described in this column can be invaluable in doing just that. These templates, which are used by faculty in multiple disciplines, place the burden of thinking through the content on the student where it should be and can be used routinely throughout a course. When using them, we strongly recommend that faculty work through these templates themselves, so that they can better help students learn to analyze and assess the reasoning embedded in written material.

{Information in this article is taken from Paul, R. & Elder, L. 2001, *The Thinker's Guide to How to Study and Learn*, Dillon Beach, CA: Foundation for Critical Thinking.}