

The Elements of Reasoning and the Intellectual Standards

Helping Students Assess Their Thinking

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There are two essential dimensions of thinking that students need to master in order to learn how to upgrade their thinking. They need to be able to identify the "parts" of their thinking, and they need to be able to assess their use of these parts of thinking, as follows:

- All reasoning has a purpose
- All reasoning is an attempt to figure something out, to settle some question, to solve some problem
- All reasoning is based on assumptions
- All reasoning is done from some point of view
- All reasoning is based on data, information, and evidence
- All reasoning is expressed through, and shaped by, concepts and ideas
- All reasoning contains inferences by which we draw conclusions and give meaning to data
- All reasoning leads somewhere, has implications and consequences



The question can then be raised, "What appropriate intellectual standards do students need to assess the 'parts' of their thinking?" There are many standards appropriate to the assessment of thinking as it might occur in this or that context, but some standards are virtually universal (that is, applicable to all thinking): clarity, precision, accuracy, relevance, depth, breadth, and logic.

How well a student is reasoning depends on how well he/she applies these universal standards to the elements (or parts) of thinking.

What follows are some guidelines helpful to students as they work toward developing their reasoning abilities:

1. All reasoning has a **PURPOSE:**
 - Take time to state your purpose clearly
 - Distinguish your purpose from related purposes
 - Check periodically to be sure you are still on target
 - Choose significant and realistic purposes
2. All reasoning is an attempt to **FIGURE SOMETHING OUT, TO SETTLE SOME QUESTION, TO SOLVE SOME PROBLEM:**

- Take time to clearly and precisely state the question at issue
 - Express the question in several ways to clarify its meaning and scope
 - Break the question into sub questions
 - Identify if the question has one right answer, is a matter of opinion, or requires reasoning from more than one point of view
3. All reasoning is based on **ASSUMPTIONS**:
- Clearly identify your assumptions and determine whether they are justifiable
 - Consider how your assumptions are shaping your point of view
4. All reasoning is done from some **POINT OF VIEW**:
- Identify your point of view
 - Seek other points of view and identify their strengths as well as weaknesses
 - Strive to be fair-minded in evaluating all points of view
5. All reasoning is based on **DATA, INFORMATION and EVIDENCE**:
- Restrict your claims to those supported by the data you have
 - Search for information that opposes your position as well as information that supports it
 - Make sure that all information used is clear, accurate, and relevant to the question at issue
 - Make sure you have gathered sufficient information
6. All reasoning is expressed through, and shaped by, **CONCEPTS and IDEAS**:
- Identify key concepts and explain them clearly
 - Consider alternative concepts or alternative definitions to concepts
 - Make sure you are using concepts with care and precision
7. All reasoning contains **INFERENCES** or **INTERPRETATIONS** by which we draw **CONCLUSIONS** and give meaning to data:
- Infer only what the evidence implies
 - Check inferences for their consistency with each other
 - Identify assumptions which lead you to your inferences
8. All reasoning leads somewhere or has **IMPLICATIONS** and **CONSEQUENCES**:
- Trace the implications and consequences that follow from your reasoning
 - Search for negative as well as positive implications
 - Consider all possible consequences