Critical Thinking and Socratic Questioning

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1 Introduction

Left unchecked, our thinking can easily become skewed, incomplete, or based on assumptions we have never examined. The aim of critical thinking is to make our reasoning more accurate and reliable by questioning how we form judgments. This includes identifying the essential questions, gathering and interpreting relevant information, evaluating proposed conclusions, and comparing different perspectives along with the assumptions that support them [2]. Within this framework, Socratic questioning offers a structured way to push reasoning further. By asking deliberate and reflective questions, it encourages learners to dig beneath surface impressions, clarify what they mean, reveal the architecture of one's thinking, challenge what they take for granted, and explore the broader consequences of their ideas. The four major objectives of Socratic questioning are: 1) Investigating the truth of a system of though. 2) Developing a latent idea. 3) Lead to a logical conclusion (even unforeseen). 4) help someone to accept a conclusion by examining it incrementally [1]. In educational contexts, this approach not only probes how much students know, but also helps them recognize the limits of their understanding and develop the habit of examining their own ideas and could help them to better understand a new concept [2, 1].

2 Checklist for dissecting thinking parts

We often need to dissect a complex issue into its individual elements, since issues in the overall system usually arise from weaknesses hidden within specific components. Effective reasoning depends on recognizing these underlying parts and understanding how each one contributes to full system.

Purpose: What is the central (and related) objective(s) ☐? Is the main (and related) objective(s) clearly stated ☐? Are they valid, realistic and significant ☐?

Questions: What main question is being addressed ☐? Are all complexities in the question being considered ☐? Is the question well-stated ☐? Is it unbiased ☐? Is it related to the purpose ☐? Are Related questions clearly articulated and distinguished ☐?

Information: What information is being used to reach the conclusion ☐? What experience supports the claims ☐? What information is it needed to settle the question ☐? Is the information relevant, essential, sufficient, necessary, accurate and complete to the issue ☐? Is the information aligned with the main conclusions ☐?

Concepts: What is the main idea/concept ☐? Are the key concepts clearly stated ☐? Are they valid, significant and related to the objective ☐?

Assumptions: What assumptions are taken for granted in order to reach a conclusion ☐? Are the assumptions clearly stated and discussed ☐? Are any questionable assumptions being used without discussion ☐? Are there any alternative assumptions that should be considered ☐?

Inferences: How were the conclusions reached ☐? Is the line of reasoning connecting the information and consequences clearly stated ☐? Are there alternative inferences ☐? Are all conclusions clear, accurate, and relevant to the issue ☐? Are conclusions going beyond what the data implies ☐? Are conclusions consistent with the data, and do they reconcile discrepancies ☐? Do the conclusions answer the main questions ☐?

Consequences: If one accepts the claims, what would be the significant implications (both positive and negative) ☐? If the claims fail, what would be the consequences ☐? Are possible consequences clearly stated and discussed ☐?

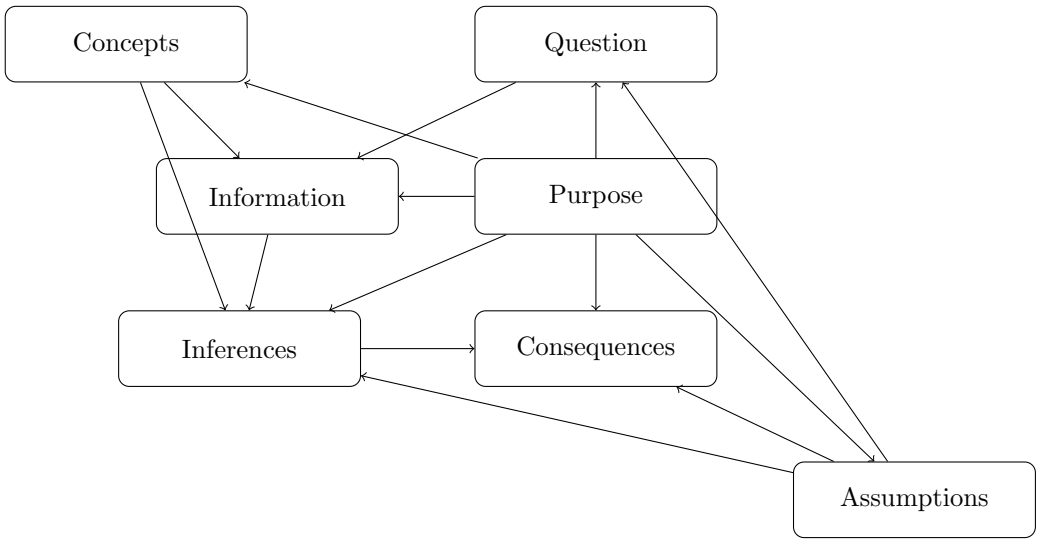

Figure 1: Thinking parts relationships

3 Assess standards of thinking

The following questions can be used to assess different aspects of thinking and can easily be adapted to many real-world cases.

Clarity: Could you elaborate further? Could you illustrate what you mean?

Accuracy: How could we verify its validity or truth?

Precision: Could you be more specific/precise? Could you give me more details?

Clarity: How is this related to the question? How can this address the task?

Depth: Why is this a difficult/complex problem?

Breadth: Which other perspectives should be considered regarding the problem?

Logic: Does the claim A fit with claim B? Do all claims make sense together? Does the consequence follow logically the evidence?

Significance: Should this be the central problem/idea to focus on?

Fairness: Are there any underlying interests at play here?

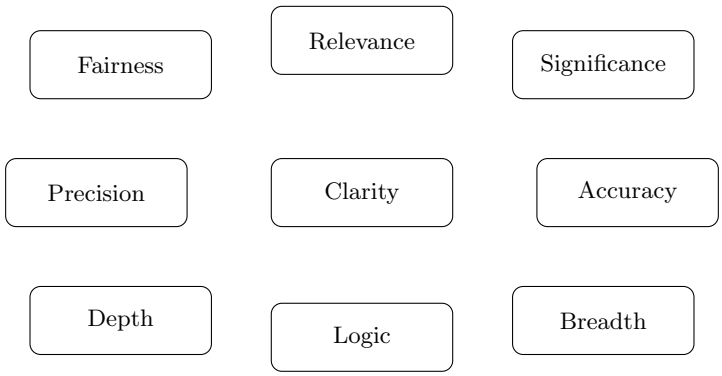

Figure 2: Main elements to assess intellectual standards

4 Four directions questions

One useful way to organize inquiry is to consider four distinct directions in which thinking can be explored. Recognizing these four dimensions allows us to probe thinking more effectively and reveal how it is constructed. Every act of thought: 1) Emerges from a particular background, perspective and assumptions (Axioms). 2) Rests on reasons, evidence, that give it structure (Support). 3) Points toward certain outcomes or consequences (Implications). 4) Stands among multiple possible ways of interpreting or approaching the issue (Alternatives).

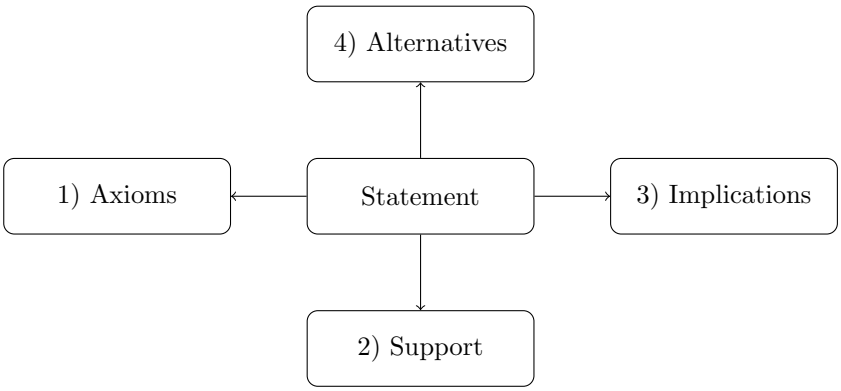

Figure 3: Four directions questions

5 Identify prior questions

When a question is complex, it often rests on other questions that must be addressed first. A helpful strategy is to identify the main question, then list the

simpler, underlying questions that need answers before the central issue can be resolved. By repeatedly breaking each question into earlier, more basic ones, we uncover the structure of the problem and clarify the reasoning needed to approach it.

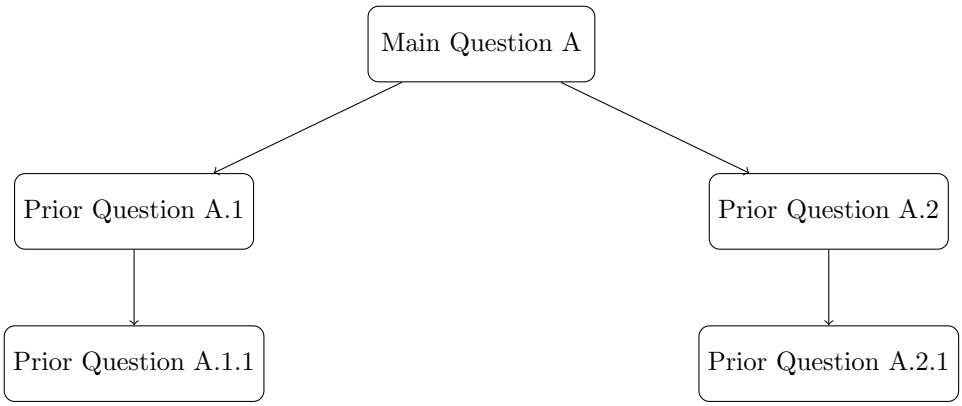

Figure 4: Prior questions procedure

6 Complex Interdisciplinary Questions

When a question spans several areas of knowledge, it helps to identify each domain explicitly. A complex issue may involve economic, social, cultural, political, ethical, psychological, or other dimensions. By naming these domains and asking targeted questions within each one, we avoid overlooking important aspects of the problem. This approach prompts us to ask: Which domains are relevant? Have we considered them all? Are any significant areas missing? Mapping the domains makes the structure of the question clearer and encourages deeper analysis.

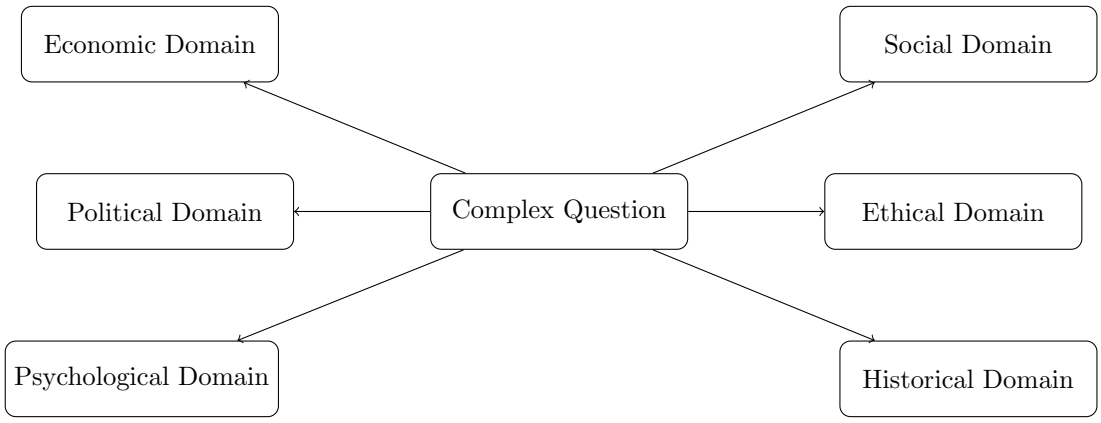

Figure 5: Making complex interdisciplinary questions

7 Mechanics of Socratic questioning

7.1 Kinds of Socratic questioning

Spontaneous

- Ask for concrete examples to clarify a point just made.
- Request evidence or reasons supporting a claim.
- Offer possible counterexamples to test the strength of an assertion.
- Check for consensus within the group (e.g., "Does everyone agree?").
- Introduce related or parallel examples to deepen comparison.
- Provide an analogy that sheds light on a position.
- Ask someone to restate an opposing view in their own words.
- Reformulate student contributions clearly and accurately.

Exploratory

- What is the general idea of X?
- Why does X exist or matter?
- In what situations could X lead to difficulties or challenges?
- What does it take to engage well in X (or to be good at it)?
- How does X differ from closely related concepts (e.g., X vs. Y)?

- What distinguishes wanting X from needing X?
- What purposes or functions does X serve?
- How can we tell when X is used appropriately or inappropriately?
- In what ways is X similar to or different from Y?

Focused

- Why is X significant or valuable?
- What fundamental assumptions underpin work done in X?
- What has been understood or achieved through the use of X?
- What kinds of questions or problems should X help us investigate or resolve?
- How does X differ from other ways of studying or understanding the world?
- What major subfields or branches fall under the broader domain of X?
- How might our lives or practices be different if X did not exist, or if no one applied its methods?
- What are the limitations or boundaries of what X can address?
- To what extent can X provide solutions to the challenges we face?
- Has the use of X ever produced unintended or problematic consequences?

8 Examples of questions for Socratic dialogue

8.1 Clarification

- What do you mean by ____?
- Could you rephrase that or put it another way?
- What is your main point or the central issue here?
- How does ____ relate to ____ or to our discussion?
- Could you provide an example or clarify with a scenario?
- Could you explain that further or elaborate?
- Why do you say that? What reasoning supports it?
- Let me see if I understand you: do you mean ____ or ____?
- Could someone summarize what another person has said to check understanding?

8.2 Purpose

- What is the purpose of ____?
- What was your purpose when you said or did ____?
- How do the purposes of these individuals or groups differ?
- How does the purpose of a character or participant change over time or in context?
- Is this purpose reasonable or justifiable?
- Why is it important to address this question or issue at this time?

8.3 Assumptions

- What are you assuming in this situation?
- What is ____ assuming?
- Could a different assumption be made instead?
- You seem to be assuming ____. Do I understand you correctly?
- How would you justify this assumption? Why take it for granted?
- Is this assumption always valid? Why do you think it applies here?

8.4 Information, Reasons, Evidence, and Causes

- What would be an example of this?
- How do you know or how did you determine that?
- What are your reasons or evidence for saying that?
- Could you explain your reasoning or the basis for your belief?
- Is this evidence reliable or adequate? Are there reasons to doubt it?
- What other information or evidence would help clarify this issue?
- How does this information apply to the case at hand?
- Who is in a position to know whether this is true?
- What could convince you otherwise or change your mind?
- How did this situation or outcome come about? What accounts for it?
- By what reasoning did you reach that conclusion?
- Could someone else provide evidence or support for that response?

8.5 Perspectives

- You seem to be approaching this issue from ____ perspective. Why choose this perspective over another?
- How might other individuals or groups respond? What factors would influence them?
- What objections or alternative viewpoints could be raised?
- Can anyone see this differently? What would someone who disagrees say?
- What is an alternative approach or explanation?
- How are different ideas or perspectives similar or different?

8.6 Concepts

- What is the main idea or concept we are dealing with?
- Why or how is this idea important in this context?
- Are there conflicts between ideas? If so, how?
- What ideas or theories are guiding the thinking of a person or character?
- How is this idea influencing our own reasoning? Could it be causing problems?
- Are key terms being used consistently and appropriately?
- What main distinctions should we make in reasoning through this problem?
- Are there ideas in the text or argument that are problematic or need closer examination?

8.7 Inferences and Interpretations

- What conclusions are we drawing about ____?
- On what evidence or information are these conclusions based?
- How did you reach that conclusion? What reasoning led you here?
- Is there a more logical or plausible inference we could make?
- How should we interpret these actions, behaviors, or data? Are there alternative interpretations?
- Given the facts, what is the most reasonable conclusion?
- What do you think of this conclusion? Does it make sense in context?

References

[1] R. Paul and L. Elder. The thinker´ s guide to the art of socratic questioning. foundation for critical thinking, 2007.

[2] R. Paul and L. Elder. *The miniature guide to critical thinking concepts and tools*. Rowman & Littlefield, 2019.