

The Role of Socratic Questioning in Thinking, Teaching, and Learning

One of the reasons that instructors tend to overemphasize “coverage” over “engaged thinking” is that they do not fully appreciate the role of questions in teaching content. Consequently, they assume that answers can be taught separate from questions. Indeed, so buried are questions in established instruction that the fact that all assertions — all statements that this or that is so — are implicit answers to questions is virtually never recognized. For example, the statement that water boils at 100 degrees centigrade is an answer to the question “At what temperature centigrade does water boil?” Hence every declarative statement in the textbook is an answer to a question. Hence, every textbook could be rewritten in the interrogative mode by translating every statement into a question. To our knowledge this has never been done. That it has not is testimony to the privileged status of answers over questions in instruction and the misunderstanding of teachers about the significance of questions in the learning (and thinking) process. Instruction at all levels now keeps most questions buried in a torrent of obscured “answers.”

Thinking is Driven by Questions

But thinking is not driven by answers but by questions. Had no questions been asked by those who laid the foundation for a field — for example, Physics or Biology — the field would never have been developed in the first place. In fact, every intellectual field is born out of a cluster of questions to which answers are either needed or highly desirable. Furthermore, every field stays alive only to the extent that fresh questions are generated and taken seriously as the driving force in a process of thinking. To think through or rethink anything, one must ask questions that stimulate thought.

Questions define tasks, express problems and delineate issues. Answers on the other hand, often signal a full stop in thought. Only when an answer generates a further question does thought continue its life as such. This is why it is true that only students who have questions are really thinking and learning. Moreover, the quality of the questions students ask determines the quality of the thinking they are doing. It is possible to give students an examination on any subject by just asking them to list all of the questions that they have about a subject, including all questions generated by their first list of questions. That we do not test students by asking them to list questions and explain their significance is again evidence of the privileged status we give to answers isolated from questions. That is, we ask questions only to get thought-stopping answers, not to generate further questions.

Feeding Students Endless Content to Remember

Feeding students endless content to remember (that is, declarative sentences or “facts” to remember) is akin to repeatedly stepping on the brakes in a vehicle that is, unfortunately, already at rest. Instead, students need questions to turn on their intellectual engines and they must themselves generate questions from our questions to get their thinking to go somewhere. Thinking is of no use unless it goes somewhere, and again, the questions we ask determine where our thinking goes. It is only when our thinking goes somewhere that we learn anything of value to us.

Deep questions drive our thought underneath the surface of things, force us to deal with complexity. Questions of purpose force us to define our task. Questions of information force us to look at our sources of information as well as at the quality of our information. Questions of interpretation force us to examine how we are organizing or giving meaning to information and to consider alternative ways of giving meaning. Questions of assumption force us to examine what we are taking for granted. Questions of implication force us to follow out where our thinking is going. Questions of point of view force us to examine our point of view and to consider other relevant points of view. Questions of relevance force us to discriminate what does and what does not bear on a question. Questions of accuracy force us to evaluate and test for truth and correctness. Questions of precision force us to give details and be specific. Questions of consistency force us to examine our thinking for contradictions. Questions of logic force us to consider how we are putting the whole of our thought together, to make sure that it all adds up and makes sense within a reasonable system of some kind.

Dead Questions Reflect Dead Minds

Unfortunately, most students ask virtually none of these thought-stimulating types of questions. They tend to stick to dead questions like “Is this going to be on the test?” questions that imply the desire not to think. Most teachers in turn are not themselves generators of questions and answers of their own, that is, are not seriously engaged in thinking through or rethinking through their own subjects. Rather, they are purveyors of the questions and answers of others — usually those of a textbook.

We must continually remind ourselves that thinking begins within some content only when questions are generated by both teachers and students. No questions equals no understanding. Superficial questions equals superficial understanding. Most students typically have no intellectual questions. They not only sit in silence; their minds are silent at well. Hence, the questions they do have tend to be superficial, ill-formed and self-serving. This demonstrates that most of the time they are not thinking through the content; they are presumed to be learning.

If we want to engage students in thinking through our content we must stimulate their thinking with questions that lead them to further questions. We must overcome what previous schooling has done to the thinking of students. We must resuscitate minds that are largely dead when we receive them. We must give our students what might be called “artificial cogitation” (the intellectual equivalent of artificial respiration).

The Art of Socratic Questioning

The art of Socratic questioning is important for the critical thinker because the art of questioning is important to excellence of thought. What the word ‘Socratic’ adds is “systematicity”, “depth”, and a keen interest in assessing the truth or plausibility of things.

There is a special relationship between critical thinking and Socratic Questioning because both share a common end. Critical thinking gives one a comprehensive view of how the mind functions (in its pursuit of meaning and truth), and Socratic Questioning takes advantage of that overview to frame questions essential to the quality of that pursuit.

The goal of critical thinking is to establish a disciplined “executive” level of thinking to our thinking, a powerful inner voice of reason, to monitor, assess, and re-constitute — in a more rational direction — our thinking, feeling, and action. Socratic discussion cultivates that inner voice by providing a public model for it.

The Spirit and Principles of Socratic Questioning

While there are numerous ways in which Socratic Questioning can be effectively executed in the classroom, there are a set of principles, which guide a Socratic dialog. In this section, these principles are laid out in the form of directives.

Teachers Engaged in a Socratic Dialog Should:

- Respond to all answers with a further question (that calls upon the respondent to develop his/her thinking in a fuller and deeper way)
- Seek to understand—where possible—the ultimate foundations for what is said or believed and follow the implications of those foundations through further questions
- Treat all assertions as a connecting point to further thoughts
- Treat all thoughts as in need of development
- Recognize that any thought can only exist fully in a network of connected thoughts. Stimulate students — through your questions — to pursue those connections
- Recognize that all questions presuppose prior questions and all thinking presupposes prior thinking. When raising questions, be open to the questions they presuppose. (See the section on logically-prior questions.)

Teachers engaged in Socratic dialog should systematically raise questions based on the following recognitions and assumptions:

Focusing on The Elements of Thought

- Recognize that all thought reflects an agenda. Assume that you do not fully understand the thought until you understand the agenda behind it. (What are you trying to accomplish in saying this? What is your central aim in this line of thought?)
- Recognize that all thoughts presuppose an information base. Assume that you do not fully understand the thought until you understand the background information that supports or informs it. (What information are you basing that comment on? What experience convinced you of this? How do we know this information is accurate?)
- Recognize that all thought requires the making of inferences, the drawing of conclusions, the creation of meaning. Assume that you do not fully understand a thought until you understand the inferences that have shaped it. (How did you reach that conclusion? Could you explain your reasoning? Is there an alternative plausible conclusion?)
- Recognize that all thought involves the application of concepts. Assume that you do not fully understand a thought until you understand the concepts that define and shape it. (What is the main idea you are putting forth? Could you explain that idea?)
- Recognize that all thought rests upon other thoughts (which are taken for granted or assumed). Assume that you do not fully understand a thought until you understand what it takes for granted. (What exactly are you taking for granted here? Why are you assuming that?)
- Recognize that all thought is headed in a direction. It not only rests upon something (assumptions), it is also going somewhere (implications and consequences). Assume that you do not fully understand a thought unless you know the implications and consequences that follow from it. (What are you implying when you say that? Are you implying that . . . ?)
- Recognize that all thought takes place within a point of view or frame of reference. Assume that you do not fully understand a thought until you understand the point of view or frame of reference which places it on an intellectual map. (From what point of view are you looking at this? Is there another point of view we should consider?)

- Recognize that all thought is responsive to a question. Assume that you do not fully understand the thought until you understand the question that gives rise to it. (I am not sure exactly what question you are raising. Could you explain it?)

Systems and Contexts For Thought

- Recognize that all thought has three possible functions: to express a subjective preference, to establish an objective fact (within a well-defined system), or to come up with the best of competing answers (generated by competing systems). Assume that you do not fully understand thinking until you know which of the three is involved. (Is the question calling for a subjective or personal choice? If so, let's make that choice in terms of our personal preferences. If not, then, is there a way to come up with one correct answer to this question (a definite system in which to find the answer)? Or, finally, are we dealing with a question that would be answered differently within different points of view? If the latter, what is the best answer to the question, all things considered?)
- Recognize that all thought has emerged within a human context. Assume that you do not fully understand the thought until you understand the context which has given rise to it. (Tell us more about the situation that has given rise to this problem. What was going on in this situation?)

How To Prepare To Lead a Socratic Discussion

One of the best ways to prepare to lead a Socratic discussion is by pre-thinking the main question to be discussed using the approach of developing prior questions. Prior questions are questions presupposed by another question. Hence, to settle the question "What is multi-culturalism?" I should be able to first settle the question, "What is culture?" and, to settle that question, I should be able to settle the question "What is the basis of culture?" that is, "What are the factors about a person which determine what culture he/she belongs to?"

Construct A List of Prior Questions

To construct a list of prior questions, simply write down the main question which you are going to focus your discussion on and then pose a question you would have to be able to answer before you could answer the first. Then take the second question and do the same for it (i.e., determine what question you would have to answer to answer it). Then, continue on, following the same procedure for every new question on your list.

As you proceed to construct your list keep your attention focused on the first question on the list as well as on the last. If you do this well, you should end up with a list of questions which probe the logic of the first question, and hence, a list of questions which are relevant to a Socratic discussion of your first question. During the Socratic

dialog, you should loosely follow your list of logically prior questions, using it primarily as a guide for deeply probing the issue at hand.

A Sample List

As an example of how to construct logically prior questions, consider this list of questions that we developed in thinking through a key question intended for use in conducting a Socratic discussion on the question, “What is history?”

- What is history?
- What do historians write about?
- What is the past?
- Is it possible to include all of the past in a history book?
- How many of the events during a given time period are left out in a history of that time period?
- Is more left out than is included?
- How does a historian know what to emphasize or focus on?
- Do historians make value judgments in deciding what to include and what to leave out?
- Is it possible to simply list facts in a history book or does all history writing involve interpretations as well as facts?
- Is it possible to decide what to include and exclude and how to interpret facts without adopting a historical point of view?
- How can we begin to judge a historical interpretation?
- How can we begin to judge a historical point of view?

Sample Socratic Dialogue

In this final section, we provide a sample high school Socratic questioning dialog:

Teacher (T): This is a course in Biology. What kind of a subject is that? What do you know about Biology already? Kathleen, what do you know about it?

Kathleen: It's a science.

T: And what's a science?

Kathleen: Me? A science is very exact. They do experiments and measure things and test things.

T: Right, and what other sciences are there besides Biology? Marisa, could you name some?

Marisa: Sure, there's Chemistry and Physics.

T: What else?

Blake: There's Botany and Math?

T: Math...math is a little different from the others, isn't it? How is math different from Biology, Chemistry, Physics, and Botany? Blake, what would you say?

Blake: You don't do experiments in math.

T: And why not?

Blake: I guess cause numbers are different.

T: Yes, studying numbers and other mathematical things is different from studying chemicals or laws in the physical world or living things and so forth. You might ask your math teacher about why numbers are different or do some reading about that, but let's focus our attention here on what are called the life sciences. Why are Biology and Botany called life sciences?

Peter: Because they both study living things.

T: How are they different? How is Biology different from Botany? Jennifer, what do you think?

Jennifer: I don't know.

T: Well, let's all of us look up the words in our dictionaries and see what is said about them.
(Students look up the words.)

T: Jennifer, what did you find for Biology?

Jennifer: It says: "The science that deals with the origin, history, physical characteristics, life processes, habits, etc . . . of plants and animals: It includes Botany and Zoology."

T: So what do we know about the relationship of Botany to Biology? Rick?

Rick: Botany is just a part of Biology.

T: Right, and what can we tell about Biology from just looking at its etymology. What does it literally mean? If you break the word into two parts "bio" and "logy". Blake, what does it tell us?

Blake: The science of life or the study of life.

T: So, do you see how etymology can help us get an insight into the meaning of a word? Do you see how the longer definition spells out the etymological meaning in greater detail? Well, why do you think experiments are so important to biologists and other scientists? Have humans always done experiments do you think? Marisa.

Marisa: I guess not, not before there was any science.

T: Right. That's an excellent point. Science didn't always exist. What did people do before science existed? How did they get their information? How did they form their beliefs? Peter.

Peter: From religion.

T: Yes, religion often shaped a lot of what people thought. Why don't we use religion today to decide, for example, what is true of the origin, history, and physical characteristics of life?

Peter: Some people still do. Some people believe that the Bible explains the origin of life and that the theory of evolution is wrong.

T: What is the theory of evolution, Jose?

Jose: I don't know.

T: Well, why don't we all look up the name Darwin in our dictionaries and see if there is anything there about Darwinian theory. (Students look up the words.)

T: Jose, read aloud what you have found.

Jose: It says "Darwin's theory of evolution holds that all species of plants and animals developed from earlier forms by hereditary transmission of slight variations in successive generations and that the forms which survive are those that are best adapted to the environment."

T: What does that mean to you....in ordinary language? How would you explain that? Jose.

Jose: It means the stronger survive and the weaker die?

T: Well, if that's true why do you think the dinosaurs died out? I thought dinosaurs were very strong?

Shannon: They died because of the ice age, I think.

T: So I guess it's not enough to be strong, you must also fit in with the changes in the environment. Perhaps fitness or adaptability is more important than strength. Well, in any case why do you think that many people today look to science to provide answers to questions about the origin and nature of life rather than to the Bible or other religious teachings?

Shannon: Nowadays most people believe that science and religion deal with different things and that scientific questions cannot be answered by religion.

T: And by the same token, I suppose, we recognize that religious questions cannot be answered by science. In any case, how were scientists able to convince people to consider their way of finding answers to questions about the nature of life and life processes. Kathleen, you've been quiet for a while, what do you think?

Kathleen: To me science can be proved. When scientists say something we can ask for proof and they can show us, and if we want we can try it out for ourselves.

T: Could you explain that further?

Kathleen: Sure, in my chemistry class we did experiments in which we tested out some of the things that were said in our chemistry books. We could see for ourselves.

T: That's right, science is based on the notion that when we claim things to be true about the world we should be able to test them to see if, objectively, they are true. Marisa, you have a question?

Marisa: Yes, but don't we all test things. We test our parents and our friends. We try out ideas to see if they work.

T: That's true. But is there any difference between the way you and I test our friends and the way a chemist might test a solution to see if it is acidic?

Marisa: Sure, ... but I'm not sure how to explain it.

T: Blake, what do you think?

Blake: Scientists have laboratories; we don't.

T: They also do precise measurements and use precise instruments, don't they? Why

don't we do that with our friends, parents, and children? Adrian, do you have an idea why not?

Adrian: We don't need to measure our friends. We need to find out whether they really care about us.

T: Yes, finding out about caring is a different matter than finding out about acids and bases, or even than finding out about animal behavior. You might say that there are two different kinds of realities in the world, the qualitative and the quantitative, and that science is mostly concerned with the quantitative, while we are often concerned with the qualitative. Could you name some qualitative ideas that all of us are concerned with? Rick, what do you think?

Rick: I don't know what you mean.

T: Well, the word qualitative is connected to the word quality. If I were to ask you to describe your own qualities in comparison to your brother or sister, would you know the sort of thing I was asking you?

Rick: I guess so.

T: Could you, for example, take your father and describe to us some of his best and some of his worst qualities as you see them?

Rick: I guess so.

T: OK, why don't you do it. What do you think some of your father's best qualities are?

Rick: To me he is generous. He likes to help people out when they are in trouble.

T: And what science studies generosity?

Rick: I don't know. None, I guess.

T: That's right, generosity is a human quality; it can't be measured scientifically. There is no such thing as generosity units. So science is not the only way we can find things out. We can also experience qualities in the world. We can experience kindness, generosity, fear, love, hate, jealousy, self-satisfaction, friendship, and many, many other things as well. In this class we are concerned mainly with what we can find out about life quantitatively or scientifically. For next time, I want you to read the first chapter in your text book and I want you to be prepared to explain what the first chapter says. I will be dividing you up into groups of four and each group of four will develop a short summary of the first chapter (without looking at it, of course) and then we will have a spokesperson from each group explain your summary to the class. After that, we will have a discussion of the ideas mentioned. Don't forget today's discussion, because I'll

be asking you some questions that will see if you can relate what we talked about today with what was said in your first chapter. Any questions? . . . OK, . . . See you next time.

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