

Fostering Inquiry, Reasoning and Critical Thinking

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Observations and Doubts

In many places around the world one can find people with divergent views. In many of those places, tensions have grown considerably and taken the form of hateful language and even violence. Tolerance and an openness to considering alternative views and perspectives seems to be at all-time lows in some places. Advocacy seems to be displacing evidence. Anger seems to be displacing thoughtfulness. What can be done?

Earlier in my career, I thought that I could use reason and logical argumentation to enlighten those suffering from the throes of dogmatism, prejudice and intolerance. I thought that helping others to develop a scientific attitude could help cure the ills of a society suffering from intolerance. Was I wrong to have such thoughts?

What is it to have a scientific attitude? Some might say that it involves considering beliefs and statements that could potentially be shown to be false or mistaken as those beliefs and statements are worth investigating (for those keeping notes, I am thinking about Karl Popper's *Conjectures and Refutations*). If the person holding the belief or making the statement is not willing to consider that it could be wrong, then there seems to be little to be gained in pursuing discourse with that person based on an acceptance of the belief or statement if one happens to doubt that belief or statement. This could be called the *walk-away strategy*. The drawback is that no progress in terms of understanding or openness occurs as a result. I have walked away too many times.

A somewhat different approach involves thinking about what underlies thinking and reasoning. It then occurs to me to revisit Ludwig Wittgenstein's works. In the *Tractatus Logico-Philosophicus* (you really should be keeping notes), Wittgenstein observes at remark 2.1 that we picture facts to ourselves. He fails to note that we also picture things that are not factual to ourselves. Nevertheless, the remark that we picture facts to ourselves is the kernel notion in a naturalistic or constructivist epistemology – we create internal representations to make sense of things that we experience that are new, unusual or otherwise puzzling. The last remark in the *Tractatus* is that what we cannot speak about [clearly] we must pass over in silence. As it happened, there was much that Wittgenstein wanted to speak about, as is evident in *Philosophical Investigations* published after his death. In that posthumous work, he introduced the notion of language games. Not only do we create internal representations to make sense of new and puzzling things, we talk about those representations with others. We engage in language games. Such discourse represents a re-representation of the internal representations that are basically hypothetical entities that no one ever directly observes. These two ideas – creating internal representations and engaging in discourse about those representations – are the basis of a socio-constructivist epistemology that is prevalent in some educational and philosophical circles.

Then my mind wanders into ancient gardens and I stumble across the works of Sextus Empiricus and *Outlines of Pyrrhonism*. Since that work was written in Greek, I decided to read it from back to front. After describing what it is to be a skeptic but before I read that part, Sextus argues that being a skeptic will result in peace and tranquility. Is that not odd? Well, in my typical state of anxiety and confusion, it

seems highly desirable. How to achieve such intellectual peace and tranquility? I had to read the first part to find an answer to that question.

Basically, becoming a skeptic involves recognizing that many (possibly most) beliefs and statements are open to investigation. A dogmatic position results when one believes something about which there exists a basis for doubt or further investigation; a variant of dogmatism occurs when one believes that there is no possible answer to a question or issue. In both of those cases, no further inquiry can occur and the discourse is cut off (recall the walk-away strategy mentioned earlier). A skeptic, however, is someone who recognizes that further investigation is possible even when the available evidence apparently favors one or another of the many possible beliefs or positions. A skeptic, in the world of Sextus Empiricus, is not held captive by his or her beliefs.

I have to admit that from that conclusion (many or most beliefs are open to further investigation and possible refutation) to intellectual peace and tranquility is a leap – at least for me (I have short legs). Nonetheless, I have developed a few suggestions that might lead a student to a path not yet taken.

The Suggestion

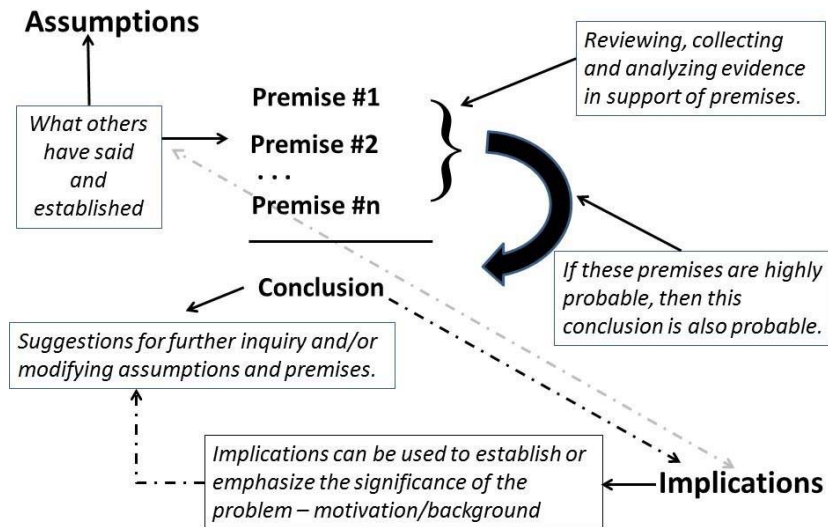
As I am close to retiring after more than 40 years in higher education, I am beginning to understand the role of a teacher in fostering inquiry, reasoning and critical thinking. There are two pieces to the puzzle that I am trying to piece together.

The first is the notion of having questions. The job of a teacher is to help students have questions – not to help them ask questions or give them answers. To have a question involves (a) admitting that one does not know (with certainty or with extremely high confidence) something, (b) committing time and effort to finding answers, (c) being willing to consider alternative perspectives and approaches, and (d) being willing to revisit the entire process again and again (akin to Socrates asking Crito to explain again why he should escape). It seems to me that all too often students are taught to have answers rather than to have questions. Learning how to have questions should be considered a basic skill, akin to reading Plato's *Symposium*, writing love letters, and calculating π (I happen to love transcendental numbers). If this argument is accepted, then inquiry should be introduced early and often in primary and secondary education.

The second piece to this puzzle (which seems very difficult to put together) is a framework that can support a wide variety of inquiries – that is to say, cases of having questions. One framework that might fit into this very complicated puzzle (supporting inquiry, reasoning and critical thinking) involves considering argument forms. An argument can be considered a collection of statements (premises) offered in support of another statement (the conclusion). A form of scientific reasoning can be mapped onto this notion of an argument form. Logicians typically distinguish deductive arguments from non-deductive arguments since the criteria for evaluating them are different. That distinction is not necessarily relevant to this brief and tenuous excursion into inquiry learning. The figure below depicts the general form of an argument. The reason for introducing such a framework early in a child's education is that it can establish a habit of mind – namely the habit of thinking of the adequacy of the evidence, the habit of identifying unstated assumptions that might also merit inquiry, and the habit of looking at the implications of what one believes. If those habits are established early in a child's education, then there is a remote possibility that more children will begin to think scientifically. Perhaps

there is a remote possibility that when those children become adults that they will be free from dogmas that create tension, confusion and strife within society. There is a remote possibility.

A General Framework for Inquiry & Critical Reasoning



Concluding Statement

I cannot pretend to have found answers or even useful paths to follow. I have only been able to create possibilities. With regard to possibilities, I see several varieties. There are bare possibilities, such as the possibility that the number of grains of sand on the shores of Iwo Jima at a particular point in time is an odd number. There are also practical possibilities, such as the possibility of significantly reducing hunger and violence in a particular part of the world. Another practical possibility is that the children of today may indeed become skeptical inquirers (i.e., non-dogmatic investigators) and critical thinkers. That last practical possibility, however, is not likely to occur without the efforts of many of those involved in such efforts as the Building the Scientific Mind enterprise.