Teaching Critical Thinking Dispositions

Mortimer Adler, the founder of the Great Books program at the University of Chicago, once famously wrote that critical thinking could not be taught. In his essay, "Critical Thinking Programs: Why They Won't Work," Adler wrote, "I would almost say that, for critical thinking, devising a special program to produce the desired result is a chimerical effort. It cannot be done." Certainly Adler had in mind a skill independent of content area—a skill that one used whether thinking about philosophy or physics. However, current studies in the field of critical thinking do not support Adler's claim. In fact, they indicate that critical thinking skills that span domains can be taught and can result in measureable improvements.

Those who study critical thinking divide that world into two parts: skills and dispositions. Critical thinking skills refer to practices that can be communicated in a classroom and learned by students—skills such as "how to construct an argument," "how to analyze an argument," or "how to evaluate an argument." Substantial evidence indicates that certain methodologies such as argument mapping are extremely helpful in teaching these skills. And, against Adler, targeted instruction in such skills does, in fact, improve more general (and measureable) critical thinking skills. Tim van Gelder even provides evidence that one semester of targeted instruction in critical thinking using argument mapping as the foundation of the course results in measureable gains equivalent to or greater than those gained through four years of an undergraduate education.

Of course the greater challenge facing educators, beyond that of giving our students skills in such discrete areas as argument analysis, is to help them cultivate habits of mind that define them as critical thinkers in life. However, as Barry Leshowitz (et al) writes, "Unfortunately, the results of any number of national and international studies indicate that few high school graduates (or entering college students) are able to apply higher-order thinking skills to problems faced in everyday life." In other words, the ultimate challenge in the field of the pedagogy may be helping students have the disposition to be critical thinkers in and out of the classroom. To do this, I maintain that we must understand the human brain and help students to understand their brains.

Cognitive scientists label the two primary modes of thinking as Type 1 and Type 2 processing. These modes correlate to brain systems that are called System 1 and System 2. (A recent and thorough treatment of these systems can be found in Daniel Kahneman's book, Thinking Fast and Slow). In general, Type 1 thinking is characterized by automaticity—quick, heuristic-type thinking that is sometimes labeled "lazy" or "emotional." Type 2 thinking is characterized by conscious effort—methodical, volitional enlistment of cognitive resources that involves awareness of things such as the need for evidence, rejection of biases and emotional reactions, and careful logic.

To get a feel for the distinction between these two systems, I developed a quick test that I gave to 320 college freshmen and sophomores. It reads as follows:

"Imagine being at home or in a library or at a friend's house or anywhere you might do schoolwork. For homework, you are given the following question: 'Should the death penalty be legal?' What would you do to try to best answer the question?"

Educators easily reply something like "I would do research." Students, however, are not so consistent in their responses. My survey found that only 40 percent of students gave an answer that could be interpreted as akin to "I would do research." A full 60 percent of students took a stance on the issue itself and replied with the equivalent of "The death penalty should be legal" or "The death penalty should be illegal."

This simple test provides some interesting insights into the use of System 1 and System 2. Educators, trained to approach questions from the perspective of creating an answer that will be judged based on the use of evidence and logic, picture themselves using System 2—slowly and methodically gathering evidence, building a case, and holding that case to the standards imposed by an intellectual authority. Absent that training, many students automatically deploy System 1 and provide an automatic, heuristic, lazy, or emotional response.

From this simple example, we can see more clearly that the challenge that confronts educators when it comes to asking our students to deploy higher-level thinking skills consistently is a neurological one. In other words, sometimes our students' brains' natural tendencies get in the way of careful thinking. Obviously, this does not mean that any given student will only react quickly (and perhaps unthinkingly) to a given question, resulting in shoddy use of evidence and questionable conclusions. This is meant to alert us to brain systems

at work that may not be immediately apparent to us as educators.

What should we do to help students cultivate dispositions toward critical thought? I would suggest that we need to create awareness. I present students with a wide variety of research and narratives that help them understand that humans don't naturally and consistently use System 2. These resources help students understand that we all need to be aware of our tendency toward sloppy thinking, and that their job is to exert effortful control during intellectual tasks such as writing argumentative essays, analyzing arguments, or simply reading. This awareness, I believe, is the first step in creating student dispositions toward critical thought.

Allow me to give an example of how awareness may improve critical thinking dispositions. I teach my students about amygdala hijacking, a neurological phenomenon whereby we lose our ability to deploy System 2 because part of our brain has detected a threat. That is, we can't be slow-thinking, reasonable people in the presence of a threat. Students learn that threats are not only physical (think noises in dark places or wild animals in National Parks); they can be ideas as well. Being aware of the fact that our brains can find ideas that oppose our beliefs, threatening to the point that we can't be logical, helps students see the need to consciously and willfully "override Type 1 processing" (as Keith Stanovich writes).

Next, I would suggest that the ultimate goal of critical thinking is to question answers rather than to answer questions. Most teachers find the prospect of having inquisitive, questioning students distant and exciting. Frankly, I can think of few things more gratifying than having a room full of students eager to get at the truth, even if it means questioning my authority, insisting on seeing the evidence, or practicing active skepticism. Therefore, ignoring the fact that having questioning students can be threatening, and assuming that we would like to have such students in our classrooms, we should ask, "How do we get there?"

We teach things that are open to critical inquiry, but we often teach them as if they are not. Or, students assume that they are not open to questioning, or we don't make it clear that the content we teach is open to questioning, or we assume that opening our content to critical inquiry will erode our credibility or even education in general. But if we want students to become critical thinkers—thinkers who question before accepting—we need to make explicit the idea that everything is open to critical inquiry. We should tell students, "Your job is not to learn this. Your job is to question it."

What should be questioned? There are numerous ideas that we could allow our students to question. Here is a short list: Freudian psychology, all of metaphysics, virtually every political claim, theories of self, theories of history, theories of economics—including Communism, trickle-down economics, Socialism, Keynesian economics—educational theories (including ideas about

group learning, the use of technology in the classroom, the value of the lecture), all social mores, and common prejudices. The list could be very long. One could even question Mortimer Adler's assertion that critical thinking cannot be taught.

To get to the point where students practice active skepticism, insisting on evidence before accepting an idea (a very good definition of a critical thinking disposition, by the way), students not only need to be given permission to question, they must be required to do so.

Even though I believe that instructors will be able to generate skeptical inquiry in their own disciplines in a variety of ways (if they put their minds to it), I want to offer one example of a practical means of getting students to see what this means. I call this "generating alternative theories." Here is a sample problem:

From the 1960s to the 1990s, researchers believed that the primary cause of men abusing their spouses was that men themselves had been abused as children. They theorized that men that came from abusive homes were much more likely to abuse their spouses later in life than men who did not come from abusive homes. After the 1990s, however, researchers began to suggest alternative theories. These theories contradicted those held from the 1960s to the 1990s.

Instructions: Think of an alternative theory (explanation) that is quite distinct from the one that relates spousal abuse to growing up in an abusive home. Explain your theory in as much detail as possible.

The key thing to recognize is that the goal is the creation of alternative hypotheses. This hypothetical reasoning forces us to hold two scenarios in mind and ask what evidence would be necessary to accept one, reject one, or reject both. This is the basis for Aristotle's dictum that "It is the mark of an educated mind to be able to entertain a thought without accepting it."

To get to the point where such exercises are appropriately challenging for students, many hurdles must be cleared. First, students must have skills gained through targeted instruction that allow them to perform tasks such as analyzing, creating, and evaluating arguments. Second, they must be made aware of our cognitive limitations as humans, even if that awareness amounts to something as simple as knowing that we all have a System 1 and a System 2. Third, we need to open our content to questioning. Fourth, we must teach our students how to question. Fifth, we must require that they question. Taken together, these steps will help our students develop the internal disposition toward being critical thinkers.

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