From Argument and Philosophy to Critical Thinking Across the Curriculum

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Abstract

This reflective article details the evolution of Gerald Nosich's view of what critical thinking involves. Nosich recounts three major stages in the development of his views: (1) starting a course on Reasoning that strongly engaged students in the actual practices of argument analysis and evaluation, (2) then teaching a course Critical Thinking Across the Curriculum which called into graphic prominence other aspects of critical thinking beyond arguments, for example, observing thoughtfully and reflectively, raising key questions with respect to an issue, and discerning a common structure underlying different phenomena, and, finally, (3) realizing the power of Richard Paul's emphasis on common elements and standards involved in critical thinking.

Keywords: Argument, Critical thinking across the curriculum

In this paper I want to reflect on some of the main experiences that transformed my views about critical thinking and about teaching for critical thinking.[1] This is a personal piece. I do not aim in it to put forward wholly convincing arguments for my conclusions (which are, in any event, based on additional reasons not presented here). Yet, as a critical thinker, I know that reasons and conclusions, no matter how personal, are often generalizable. Thus, I also believe that the reasons I give, especially when detailed, warrant the conclusions. Thus, an argumentative piece underlies at least some of the personal reflection.

I will focus on three main events that have profoundly changed my vision of what CT is and what it is to teach for CT. All three of these generated insights for me, but very slowly, over many years. The first centers primarily on teaching—specifically on the utter confidence I had that I was, from the beginning, teaching my students to think critically in my philosophy courses. The second centers both on argumentation and on the field of philosophy. I thought (or maybe "assumed" is the better word) that reasoning about arguments, and doing philosophy—concerned, as both of them are, with reasoning, with thinking—gave me and others a generalizable and effective overall way to think critically and to teach for critical thinking. The conclusion I eventually drew is that no matter how strong those convictions were, both were deeply flawed. The third centers on the very slow path I took (and am still taking) toward internalizing a more robust, versatile, and multifaceted conception CT.

1. I earned my PhD in Philosophy from a program that was as analytic as any department could be. It was a new department, one trying to win a reputation for rigorous philosophy, and in it I was taught a set of formidable analytic skills. Looking back, I see it as having been brutal, rigid and narrow; but the department members saw themselves as preserving the purity and the high standards of logical analysis.[2]

The first event that strongly influenced my thinking about fostering critical thinking occurred after about four years of teaching philosophy at the University of New Orleans. The courses I taught seemed highly successful. Not only were students enthusiastic, but I could see their thinking improving over the semester. By the end, students, by and large, seemed to be thinking well. I assigned them readings from philosophers (mostly contemporary analytic philosophers); then we "went over" the arguments in those readings; I usually diagrammed the premises and conclusions on the blackboard; we evaluated the arguments "together"; I asked "well-formulated" interactive questions and students responded in ways that showed how well they were following the train of reasoning; there were many Aha! moments; and many students wrote well-reasoned answers to essay exams on the main questions in the course. I thought they were engaged in top-level thinking.

Still, it slowly came to me that, with the exception of certain individuals, I was not teaching my students to think philosophically to any appreciable degree at all.[3] What is striking to me, looking back, is that it took me four years to come to this conclusion.

The reason it took so long is that I continually mixed up my own thinking with theirs. I was teaching them not so much to think things through on their own, but to follow the line of my thinking. The thinking I saw students engaging in was pretty much my own thinking. That's what happened usually on exams. Either that, or if it was the students' thinking, it was built on a very careful and complex scaffolding of explanation, argumentation and strategic questioning I had provided. If, however, I

gave them a new philosophical issue to reason through, one analogous to those we'd covered in class but one we had not explicitly discussed, they usually did not reason through it well at all. In fact, my impression is that they answered the new question in about the same way they would have if they had never taken the course.

I may be exaggerating the extent of this, but I don't think so. Informally, I pursued the question of whether they were learning to think more philosophically on their own. For example, I asked students near the end of the course to analyze a new philosophical reading *before* "we" went over it in class. The students, even many of those with high grades, were often significantly off-target, missing the conclusions, premises, mixing up main points with side issues or examples. I concluded that I wasn't teaching them how to read a philosophical paper—I was reading it *for* them (and hoping they'd pick it up, maybe from my modeling). Similarly, after a course in Philosophy of Language or Ethics, I asked individuals informally, outside of class, a question like: "Let me ask you: What would you say a language is?" or (maybe over a beer) "Do you think that doing XYZ is violating people's rights?" And, outside of class, informally, without the culture of the classroom to shape their responses, students almost never gave philosophical responses. They addressed what a language is or how rights are determined without even bringing up the sophisticated philosophical explications we had studied all semester. (Again, of course, not all students.) To my mind, this does not confirm a negative judgment about the students' abilities, but it is evidence that I was not achieving perhaps the main goal of my course. I was not teaching them to "do philosophy," to think philosophically.

My subsequent work with faculty in many disciplines has led me to conclude that my experience generalizes to instruction in other fields as well. I think there is often a good deal of CT going on in the classroom, but it is by the teachers, not usually by the students. We as teachers, my experience suggests, often engage in CT ourselves. We immerse ourselves deeply in the questions of our fields; we teach those questions again and again, and that means we often think our way through them many times, each time perhaps bringing a somewhat different perspective, or an increased knowledge base, or greater intellectual maturity in our fields, or a new angle on how to teach them effectively. I speak of myself, but all my experience working with other faculty suggests that this is something a large number of us do. *We* think critically about the topics in our classes; we think them through. Then in class we *present* students with the results of our thinking. When we see them recapitulating the process we went through, it looks for all the world as if they are thinking critically, and thinking within the discipline.

I now believe that there is a good deal of illusion in this kind of teaching experience. After the slow first shock of this realization in my philosophy classes, I decided to address the question directly: How can I help my students learn to reason better? So I started a course called "Reasoning," and I used Michael Scriven's (to me, earthshaking) *Reasoning* (1976). After a few years I wrote my own book on it, *Reasons and Arguments* (Nosich, 1976). In it I laid out a pretty good method for constructing, analyzing, and evaluating arguments. I treated all arguments as deductive (because, frankly, I didn't understand how to apply inductive arguments to anything less artificial than picking balls out of an urn or calculating conditional probabilities). In the book and in class we worked on very short arguments, mostly ones I made up or extracted from some source, and almost all, in the end, defective arguments. (An example: "Nobody has *proved* that marijuana is harmful. It should be legal" (Nosich, 1976, p. 16). My students learned to paraphrase them, break them into premises and conclusions, construct the missing premises to make the argument (deductively) valid, and then evaluate the premises for truth, mostly by learning the art of constructing counterexamples. When measured in this way, students reasoning vastly improved. By the end of the course, they could take an argument they'd never seen before, break it into premises and conclusions on their own, and make it valid by inserting a missing premise or two. Many of them were able to construct their own arguments for positions they held. And they got good at constructing counterexamples.

This was genuine reasoning. My students—virtually every one—felt they had learned something valuable. I had strong quantifiable evidence that their reasoning skills improved dramatically. They acquired skills (like coming up with counterexamples) that they'd never had before. I was awarded the Outstanding Teacher Award for the entire LSU system, and I think it was largely because of the course in Reasoning.

The realization, then, was about teaching: If I want to teach my students to reason better—in philosophy, biology, literature, anywhere—I can't really accomplish it by doing it for them. I also can't have them just learn the vocabulary and then hope that better reasoning will emerge. I have to teach them how; then have them do it themselves (not just follow along as *I* do it); then give feedback on how well they did it; and then usually have them do it again. This realization changed the whole face of teaching for me.

2. The second major event I want to describe was my slow realization that I was heavily influenced—too heavily influenced—by a philosophical model of reasoning.

I don't want to diminish the benefit my course in Reasoning had for students. But I did have nagging doubts. (a) We never did get to longer arguments. The longest we addressed were probably ten sentences, but most were

three to five sentences long. The great benefit of using short arguments was that they helped students get the sense of how the parts fit together logically. (b) We also seldom got to actual arguments in print, except for a few short ones from ads. If I gave my students an editorial to read, it was considerably harder for them to extract the logical argument in it. Thus, (c) the skills they acquired didn't transfer well to my mainstream philosophy classes. A paper by Bertrand Russell or Judith Jarvis Thomson was just about as opaque as before. Quine's "Two Dogmas" (1951) fell apart in a mass of premises going in every direction but maybe that was Quine's fault). I was the one who still had to extract and formulate the argument for them then to reason about. Certainly it would have taken weeks to go through a philosophy paper sentence-by-sentence as my method and Scriven's inadvertently suggested to students, and there wouldn't be much to show for that much work.

Another nagging doubt had to do with (d) those missing premises needed to make an argument valid, and the resulting sound argument (one hoped) that would be produced. Those of you who teach deductive argumentation have probably come up against the same problem, but the lessons you draw from it and your ways of addressing it may well be different from mine. The problem came when we tried to find a good argument in favor of something interesting, something I did not know full well beforehand (something a little more surprising than that Socrates was in fact mortal), in favor of something I thought *needed* to be argued for. Such arguments invariably seem to require at least one premise (stated or assumed) that almost always turns out to be false.[4]

In the parlance of logic, for an argument to be sound, of course, the argument has to be valid, and all its premises have to be true. For an argument to be valid, its conclusion has to follow logically—necessarily—from the premises. So, in a sound argument, the premises are true, the conclusion follows necessarily from them, and therefore the conclusion has been *proved*. It is an extremely stringent notion.

I find that there is a kind of self-deception that teachers of deduction (including myself, back then) use to make arguments seem sound when they are not. Here's an example from a reasoning textbook: It's an argument for the conclusion that athletes are overpaid. The premises describe how teachers are paid less than athletes even though the job athletes perform is of less value. The key missing premise, the authors say, is that "Persons should be paid in proportion to the value of the work performed" (Hintikka & Bachman, 1991). That sounds plausible enough. But phrased in this seemingly reasonable way, the missing premise will not make the conclusion follow logically. The missing premise actually has to say something much more sweeping: "The *only* factor in determining what a person should be paid is the value of the work that person performs."

That missing premise is much too strong to be true. It is easy to think of other factors that might enter in. In my critical study of the text, I say that "each of the realistic arguments the authors reconstruct inevitably ends up containing one of those egregiously false premises that are so often the price paid to make an argument valid" (Nosich, 1993, p. 153).

This is not an isolated example. One of the amazing things to me, looking back with hindsight, is the difficulty, the virtual impossibility, of coming up with sound arguments in favor of something interesting. It took years for this to become apparent to me. I think I was dazzled by the logical perfection of validity into believing that there in fact were valid arguments with true premises all around me. I could construct them at will—"All mice are rodents; all rodents are mammals; therefore all mice are mammals"—but it didn't impress itself on me that they were almost invariably as trivial as that one. In writing this reflection piece, I looked (cursorily) at textbooks on deductive reasoning. In most of them I could not find even a single example of a sound argument with an interesting conclusion. In my own book, *Reasons and Arguments* (1982), I found only one.[5] Every other interesting argument in my 300-page book turns out in the end to be a "bad one." Meaning: it was invalid, and when I made it valid by adding missing premises, the resulting deductive argument was never sound. That was OK with me—I used it as a way of showing how faulty the arguments were. But when I wanted to have some examples of good arguments, in favor of interesting conclusions, I had a world of trouble.

My conclusion is that I was teaching an ideal of reasoning—a valid argument with true premises—but it was an ideal so perfect that no actual realistic argument could ever attain it. Not only that, but it's an ideal that, strictly speaking, can't even be approximated. "Soundness" is an all-or-nothing concept. I can't even really "come close." To "come close" to a valid or sound argument is simply to give one that is *in*valid, *un*sound.

But probably (e) the main nagging doubt came when I wanted to reason about things other than arguments. What about *issues*—like the ethics of spanking one's children, say? Or *decisions* and *actions*—like whether to marry someone, or whether I should have evacuated New Orleans before Hurricane Katrina? What about *explanations*—like how a carburetor works? The method I had worked out, based on standard cognitive tools of analytic philosophy, usually didn't apply very well. I thought I was articulating a way of reasoning about *anything*, but I was dealing almost exclusively with *arguments*. That was more or less OK with me as long as I believed that reasoning about arguments laid a strong foundation for reasoning about other things. The solution I found was

to treat issues, actions and explanations *as if* they were indeed arguments. I found that the concept *argument* was malleable enough to accommodate those related contexts. But the accommodation certainly wasn't a neat one.

For example, with an issue like spanking one's children, I could address it this way: think of the best arguments *for* it, and the best arguments *against* it; evaluate all of them and then choose the one that was best. (That sounds easier than it is, since *none* of them turn out to be clearly sound—those missing premises, again.) But what if I just wanted to reason about the issue itself? Not the arguments for and against, but the issue itself? What effects does spanking actually have on children? How would I find out about that? Why have so many people done it over history? Was it just cultural blindness that allowed it? Or is it just cultural bias for me to be so much against it now? Why are many cultures so strongly opposed to it? What are parents' goals in spanking their children? Does spanking accomplish any of those goals? Which ones and to what degree? Is spanking just taking out one's anger on the child? Always? Does it have positive effects that I'm not seeing? Does it in fact, as people say, teach children to solve problems by resorting to violence? (By that logic, wouldn't taking away a privilege teach them to solve problems by taking away other people's privileges?)

What hits me as I look at such questions is that asking and formulating them seem to me to be clearly acts of reasoning. It's not all there is to reasoning about the issue, but it's an important part of it. It may not be critical thinking yet, but if, before asking them, I first ask myself, reflectively, "What questions should I be raising about this issue?" I seem to be engaged in critical thinking as well.

The thing is, though, it is not argumentation. The argumentation model prompts me to ask questions primarily about the extent to which the conclusion follows from the premises and the plausibility of the premises themselves, sometimes about equivocation and structure. But coming up with such open-ended, free-floating but certainly relevant questions, I realized, was not a part of the argument-analysis model. Questions are involved in the model somehow, but not explicitly. They don't play an organized role. Rather than being an essential part of the reasoning itself, they seem, in a way, just start-offs. (Though I didn't realize it at the time, this was a re-enactment of the logic of discovery versus the logic of justification. Arguments, I would say now, are a main avenue in the logic of justification. But discovery, figuring things out in the first place, even if tentatively, is part of reasoning also, a crucial in fact.)

Actually, to be fair to myself, I was dealing very early with issues that weren't arguments. The last of the six chapters of my book is on "Reasoning Things Out." In it I tried to address reasoning out items other than arguments: issues and strategies, actions and decisions, the features of one's life, and finally what I called "A Method for Analyzing 'Things,'" where "things" included items like trial by jury, the institution of private property, cultural taboos, habits, relationships, even carburetors. Steps in that eight-step method included asking: What is the purpose or goal of the thing? What alternative ways are there of achieving that purpose? How does its historical context influence the "thing" (Nosich, 1982, pp. 279-280)?

That was the chapter I was most proud of. But it brought home to me, still in an inchoate way, other important reasoning concepts that did not play much of a role in the argumentation models I knew about. Where did asking about *purpose* fit into the analysis of an argument? Where did asking about *alternatives* fit? Where in the argumentation model does one place an item in its historical context, in order to understand it not merely as an abstraction? Thinking in terms of such concepts, reflectively, seemed to me not just off to the side of CT, but key parts of CT itself.

I remember arguing with Bob Ennis back in 1982, at the first International Conference on Critical Thinking I attended, that critical thinking was not just reasonable reflective thinking about what to believe. It also involved thinking about *what to do*. Chapter 6 in my book, I explained, was largely about what to do. Bob, being the eminently reasonable reflective person that he is, changed his definition. I didn't know until he told me years later that my arguments are what changed his mind.

At the time, I thought my departure from strict argumentation was truly radical. But at that first conference I attended, Richard Paul talked about aspects of CT that I'd honestly never considered. He talked about what it was to be a critical thinker, for example. Not critical think*ing*, not the activity or the skills, but the person: a critical think*er*. He talked about the "intellectual virtues" involved in being a critical thinker. (I was still an old-school analytic philosopher, and talk about "virtues" made me nervous.) He talked about what were to me purely psychological concepts (like egocentrism and self-deception) as part of critical thinking. (In my graduate school we would have called this "psychologizing," and dismissed it as irrelevant—as if the psychological dimension of a person's thinking could possibly be irrelevant to the quality of that thinking.) Many of these are aspects of CT I now take for granted, and many of them, in one form or another, are now part of the standard dialogue about CT. But in 1982, they were interesting, but far removed from any conception of CT I had. (I'd like to say that I was receptive to them even then, but the truth is I don't remember whether I was or not. My guess is that I probably shunted them off to the side. As I would describe it now, what I had then was a philosophy-based model of CT, and these new features, no matter how insightful, had no place in it.)

So the second event that transformed my views on critical thinking was the slow, imperceptibly gradual realization that CT is not just about argumentation. Along with this came the conclusion that models for teaching argumentation—deduction, induction, informal logic, syllogisms, fallacies and the like—though important, have only limited applicability.[6] I can reason about *anything*. I can analyze a short story, my relationship with a friend, plate tectonics, newspaper reporting, music, anything. Argument is just one species of "thing" you can reason about.

In fact, critical thinking isn't even *primarily* about argumentation. I came to the conclusion that argument is tremendously important in some fields—philosophy, some of the more discursive parts of the social sciences, rhetoric, a number of others. Moreover, it probably plays *some* role in all fields. But in many fields its use is more or less confined to the places where *justification* was needed, and even then it is only one variety of justification.

My conclusion is probably not startling to you. Indeed, I don't think it was startling to me. But I had not come to terms with the implications that had for CT and for teaching for CT across the curriculum.

This was brought home by a course I taught in the late 80s, specifically on Critical Thinking across the Curriculum. The only text I required for the course was whatever texts students were using in their other subject-matter courses. I began by explaining what an argument was, and telling them that we were going to spend a lot of the semester learning to analyze and evaluate arguments from their textbooks in other courses. So I sent the students out to bring in examples of arguments from their textbooks.

But what they brought back were not arguments. Usually they were explanations. A biology book would explain how the cell membrane works; an art-appreciation text would explain the structure of painting by Rubens; a psychology text would explain classical conditioning, and so forth. Sometimes the text would be laying something out: the parts of the cell, Maslow's hierarchy of needs, major food groups, and so forth. Sometimes a history book would explain the causes of the Civil War and then give a narrative of people's lives at the time. Sometimes they would be giving rules, guidelines or heuristics for engaging in thoughtful action or solving problems: start off your essay with a thesis statement; to solve simultaneous equations with two unknowns you first. . . ; or a composition text would describe the accepted ways to use a comma, and give practice exercises. This wealth of items seemed radically different from one another.

I told students these were not arguments ("An argument," I'd say, "is a set of reasons given for believing a conclusion"). These were explanations, or classifications, or guidelines, or narratives, or something else: there was no conclusion; there were no reasons given. When the students tried again with the same results, I borrowed their textbooks, determined to bring in some examples of arguments for us to then analyze in class.

In most textbooks, in all but a few fields, there were no arguments at all.

It left me with a few choices about how to interpret the situation:

(a) If we're going to teach students to think critically in disciplines, the textbooks and courses should be reformulated so as to put arguments at the core. Change the course from "How does a cell work?" to "What reasons do we have for coming to the conclusion that this is how a cell works?"; from "This is Maslow's hierarchy of needs. Apply it to patient X in the following case study" to "What are the arguments for and against conceptualizing and organizing needs in the way Maslow does? And give reasons for and against various ways of applying it to patient X in the following case study."

(b) The stuff in the textbooks was not reasoning; it was just the raw material for reasoning. Once you knew that material, then you could begin doing the real work of biology or journalism. That real work was argumentation.

(c) Though the paragraphs in the textbooks did not seem to be arguments, I could think of them, maybe, as arguments of a different kind. They might, indirectly, be understood as abductive arguments or arguments to the best explanation, or at least important parts of such arguments. (They certainly didn't look like arguments, abductive, inductive, or anything else. At best, the explanations given were *conclusions* that had been drawn from unmentioned arguments-to-the-best-explanation.)

(d) There were many aspects of thinking critically, of reasoning things out, and many of them were quite distant from argumentation. Here are a few (some more general than others). One can, for example:

- observe and report thoughtfully and reflectively, judging clearly and accurately about what were the most important considerations to address in the question at hand,
- carefully organize and outline a set of materials in order to lay it out in a clear, understandable way,
- apply health principles and procedures to a patient or client, and do so thoughtfully, making careful judgments about what was appropriate in this case, taking account of the person's cultural and emotional make-up, as well as possible complications,
- research a topic, acquiring and applying library and scholarly skills,

- raise some of the key questions with respect to an issue, so that people could then see it in a deeper way,
- give a deep, clear, well-reasoned analysis of a poem, a story, a character in a drama, a piece of music, a painting . . . ,
- discern a common structure underlying different phenomena,
- develop the skills of writing a good summary or abstract,
- thoughtfully and accurately relate an artist's life to the art he or she produced, in such a way that it increases our understanding of the art,
- accurately describe how another person sees the world.

And one can also give reasons in support of conclusions.

Eventually, I chose (d), that there are many distinct ways of engaging in CT. It is the one that seems clearly, to me at least, the most reasonable. (It is embarrassing to realize that for a while I chose (a), the arrogant one, the one that sees one's own field as the foundation for everything else.)

Why do I think all of these are CT? Because all can be done thoughtfully and reflectively, or done by rote, or simply by following someone's instructions. All of them involve cognition, thinking, in a straightforward way. All can be done clearly or unclearly, or somewhere in between. All of them can be done reasonably or unreasonably; with bias or fair-mindedly; relying on luck to carry them through well or on carefully examined previous experience, well-established principles, and best practices; done with sensitivity to nuance or crudely, with a keen awareness of context and background information or by shooting from the hip.

Why do I think they are all substantially different from one another? I do know that someone could recast all (or most of them) somehow as *arguments*. Much of the time, when I talk about them with people in philosophy, that is the move they automatically make. But why would we do that? Most of them, including the arguments, could be recast as *explanations* just as well. (For example, "an argument is a way of explaining our reasons for drawing our conclusions.") Most of them could be recast as applications, as reporting, as story-telling, as strategies.

When I articulated my conclusion—that reasoning and critical thinking were not only, or even primarily, concerned with argument—it was certainly not a surprise to people in other fields. Not only did they take it for granted, they usually couldn't even see how I could view this as a revelation. As a result, it led me to a conclusion about my own discipline, philosophy. I realized that underneath my allegedly comprehensive idea of CT was another conception, a distinctly philosophy-centered one. The conclusion I came to is that what philosophers do when they are thinking critically (or reasoning, for that matter) is not representative of what CT is in general. The field of philosophy, though important to critical thinking, is not central. It emphasizes just a few varieties of critical thinking, and only a subset of critical-thinking skills.

As I mentioned earlier, there is a sense in which this is widely recognized among critical-thinking theoreticians. For example, the famous definition of CT by Michael Scriven and Richard Paul from 1987 goes well beyond argumentation and the skills that are paramount in philosophy:

> Critical thinking is the intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and/or evaluating information gathered from, or generated by, observation, experience, reflection, reasoning, or communication, as a guide to belief and action. In its exemplary form, it is based on universal intellectual values that transcend subject matter divisions: clarity, accuracy, precision, consistency, relevance, sound evidence, good reasons, depth, breadth, and fairness (Scriver & Paul, 1987)

Indeed, this seemingly wide-ranging definition was criticized for being *too restrictive*.

Nevertheless, I think it is not a conclusion widely held by philosophers who teach stand-alone CT courses or who write critical-thinking texts. I have an impression of this, one not based on systematic study or testing, but on my own experience of talking with professional philosophers and an unsystematic reading of dozens of critical-thinking texts. The impression is that such classes and texts, though intended to teach CT that is discipline-neutral, instead tend to emphasize the skills and dispositions that are important when doing academic philosophy. These include: dealing with language (like argumentation or truth conditions); working on clarifying and defining concepts, particularly abstract ones like justice, or mental states, or rights; identifying assumptions and conclusions; identifying and explicating important distinctions that have not been noticed before; thinking of alternative possibilities, especially in relation to whether a point of view is justified or not; focusing on logical necessity or cogency; being skeptical about received "truths," and backing up that skepticism with reasons.

What philosophy as a field does not emphasize much includes close careful observation (as in nursing, say, or in good reporting); performing experiments or empirical testing; psychological and emotional acumen; reasoning about causes and effects of physical phenomena; figuring out how an abstract principle fits a specific and complicated situation.

Why do I belabor this point? It is because stand-alone CT courses, often taught under the auspices of

departments of philosophy, are often still taught it as if argumentation and the reasoning skills that are important in philosophy are the main substance or the foundation of CT across the board. Many of them emphasize fallacies and informal logic; even formal logic still sometimes appears. CT tests, designed to measure the CT skills of students in general, sometimes focus heavily on these. I myself belong to an organization (one that I esteem highly) called AILACT: Association for Informal Logic and Critical Thinking. It is as if there is a special relationship between CT and informal logic, much closer than the one between CT and close, careful, reasonable observation, or between CT and informed, well-reasoned diagnosis and treatment. But I think that special relationship is an illusion. No reasonable medical school would teach critical thinking in medicine by emphasizing fallacies and informal logic.

3. The third event that shaped my understanding of CT and teaching for CT in a profound way was spending a year at the Center for Critical Thinking in 1991-1992. I worked there with Richard Paul (and, later, with Linda Elder). During that year, Richard and I got to talk about CT virtually every day. As I mentioned earlier, Richard had worked on many different factors related to CT: skills, the clear need for a more dialectical and dialogical approach to it, intellectual virtues like fair-mindedness or intellectual humility, the logic of questions, the effects of egocentrism and sociocentrism on thinking, the interplay between emotions and rational judgments, and many others. Only a portion of what he did fit with the ways I approached CT. My ways were still in terms of argument-related skills when dealing with arguments, and in terms of a set of fragmented, disjunctive approaches when dealing with "things" very different from arguments. Without quite realizing it, I think I was vaguely in search of some core way to approach CT in any area.

During that year, Richard extracted what he called "the elements of thought" from what he called "micro-skills." He also extracted and put into their own category what he called "intellectual standards." His key move here was to take a CT skill or ability and break it into three parts: elements, intellectual standards, and processes. Thus, the ability "to identify an assumption accurately," he analyzed into an *element* (assumption), a *standard* (accuracy), and a *process* (identifying). Another example: The first step I gave in *Reasons and Arguments* (p. 37) for how to construct an argument was to "State clearly the meaning of the conclusion." Richard would have parsed this again into *elements* (in this case, two of them: conclusion and meaning or interpretation), a *standard* (clarity) and a *process* (stating or formulating).

The result of this was a radically different way of articulating and carrying out CT. It was not philosophy-based, and not even much in accord with how philosophers tend to look at thinking. It did not yield a specifiable "method" for thinking critically. There were no steps to it, for example, no set way to begin, no set way to tell when you were finished. It was based on concepts, not steps. It was an articulation of what the main parts of critical thinking are, not a model exactly or a method. It specified eight elements (each with a range of rough synonyms) and seven to ten of the most widely applicable standards, and the "instructions" were to think things through (engage in cognitive "processes") reflectively using the elements, and to do so in accord with the standards.

Nurses, journalists, scientists, philosophers, educators—everyone, in fact—draws *conclusions*, addresses *questions at issue*, makes *assumptions*, thinks from various *points of view*, uses *concepts*. In Paul's articulation, these are all elements of thinking, and they permeate thinking in every discipline, in every enterprise. So do the intellectual standards: Thinking in any field, in any aspect of life, needs to be appropriately *clear*, *accurate*, and *relevant* to the question being addressed; it has to stress what is most *important* and be *deep* enough and *broad* enough to accomplish one's purpose; and so forth.[7]

Focusing on concepts (the individual elements and standards) rather than on "steps" brings with it a flexibility that is part of what allows it to apply to any topic. (That same flexibility, I would argue, is shared by the concept *reasoning* or *critical thinking*.) "Steps" have concreteness, definiteness, and they give one a satisfying feeling of seemingly knowing exactly what to do, of being fully in control. If the step is to "formulate the assumptions," I know what to do. I may not always do it correctly, but I know what to do: I have to spell out what, in my best judgment, the person is taking for granted and using as a key (usually unstated) part of his or her thinking. In Scriven's model in *Reasoning*, this is Step 4—after clarifying the meaning, identifying the conclusions, and portraying the structure (p. 45).

But a good deal of this definiteness is an illusion. Scriven has this as Step 4, but of course, depending on what you're reasoning about, you might well *begin* by formulating assumptions and only afterward "clarify the meaning" (Scriven's Step 1). The order of his steps is just a pedagogical convenience. It just gives you the illusion of knowing exactly where to begin. It gives you one place (of many) to begin; one possible order of steps out of a limitless set. The order of Scriven's steps is a good way to begin learning the process formally in a classroom, but in practice our reasoning takes any number of paths. (I believe that when I personally read an argument, I often begin by identifying the conclusion tentatively; I think I then usually identify the main reasons given in favor of it; very often then I tentatively judge what, if anything,

I think is weak about the argument—that is, I jump to evaluation. I find that often an early evaluation, even if I'm wrong, helps me see the assumptions the person is making. I might just get a feeling for the assumption at this point, and not actually formulate it. And so forth. Probably, my own actual process is much more variable than this. And *your* usual order, if you have one, is likely to be different from mine.)

Moreover, there is a cost for the definiteness that "steps" bring. The cost is that the more definite a "step" is, the more narrowly it applies. The step might be to "Formulate the assumptions" of the argument, but when I engage in actual CT about an argument's assumptions, I don't just formulate them. I also may need to clarify them, to compare them with other ones this arguer made in the past, to revise them, to evaluate them, to articulate what points of view would give rise to them, to think what role they might play in this or that historical, cultural, political context, to take account of how much I (or the arguer) know about the area, and dozens of other such cognitive processes. Not only that, but what the step means is to formulate *the arguer's* assumptions. But as I am trying to understand the arguer's assumptions, I may need to identify and formulate some of my own assumptions—ones I may have about the arguer, about the validity of his or her position, or about society. Since bias in my own assumptions may interfere with formulating the arguer's assumptions, I should probably reflect on my own assumptions as an important "step" in formulating his or hers.

Concepts, on the other hand—in contrast to "steps"—do not provide this definiteness, not even the illusion of definiteness. Paul's articulation directs me to think in terms of the *concept* "assumptions": certainly, I will often identify them, formulate them, clarify them, evaluate them, compare them with my own, and so forth. What I need to do to think critically about the assumptions of something—anything—is itself a matter for critical judgment. I am not saying, of course, that there is something mistaken about a teacher, say, having students formulate the assumptions of an argument. It's a good step. But it's not the only good step.

Something similar is true of the intellectual standards. They too are concepts. In reasoning about something—again, anything—I use a standard like *relevance* as an almost constant filter on the thoughts that may arise in me. It is not just premises or assumptions that have to be relevant; it is also the questions I ask, the contexts I bring to bear, the points of view I consider, and so forth. Relevance, I might say, is relevant everywhere.

During the year I spent with the Center for CT, I told Richard I would "try on" his way of formulating the dimensions of CT, I would "try on" working with elements and standards. We talked about the formulation, elaborating on it, amplifying it, applying it to teaching, to different disciplines, and to different levels of education, kindergarten through graduate school.

The striking thing for me though, is that I didn't adopt it. I didn't internalize it. Looking back, years later, it's hard for me to see why I didn't. I didn't see the elements of reasoning and the intellectual standards as the centerpiece of CT. When I gave workshops on CT to faculty, I sometimes did a session on the elements, but sometimes I didn't. Occasionally I gave a part of a session on the standards, but sometimes I didn't do that either.

I now see them as the centerpiece of CT. In my *Learning to Think Things Through: A Guide to Critical Thinking Across the Curriculum*, the elements and standards provide a way for students to think both within and about the discipline (Nosich, 2009). Students use the elements and standards to think through virtually any topic, in any discipline. There is nothing like a "universal method" there, of course—but students use the same elements and the same standards (with some variation) to think through questions in social sciences, in natural sciences, in arts and humanities, in professions,. Moreover, it is the same enterprise they can engage in when they think through questions in their lives outside of class.

Moreover, I see the elements and standards as giving an overall articulation into which more specific ways of doing CT (for example, with different subject matters or different activities) fit comfortably. Argument analysis, for example, I see as a particular way of doing CT, one that emphasizes some of the elements heavily (conclusions, assumptions, interpretation, and information) and some of the standards (clarity, cogency, relevance, accuracy of interpretation). Indeed, the tools of argument analysis sometimes give student thinking a precision, a compactness, and a focus that makes people feel almost transformed by the new-found power of their minds. But argument analysis (and, in my judgment, much of the academic philosophy I'm familiar with) does not tend to emphasize other elements or standards nearly as much (purpose, question at issue, point of view, depth, the accuracy of information, significance). Students who become good at asking key questions and following out the logic of those questions take on an intellectual power and freedom that is just as profound.

Scientific method is another specific way of doing critical thinking. So is nursing process and clinical reasoning. So is art and music analysis. So is statistics (if it is taught as a thinking course). So are others. Each of them emphasizes certain of the elements and de-emphasizes others. But the elements that in a particular method are not given prominence often open up a very different way of reasoning.

I think that when the internalization really clicked in for me, it came in a way that brings me back to the

teaching point I made at the beginning. I found that when I myself faced an issue or a problem or a difficult question, I could think it through explicitly using the elements of reasoning. The issue could be of any sort—emotional, a practical decision I had to make, a choice between options that were really incommensurable, a relationship I had with someone who was important to me, a point of view that I had difficulty being intellectually empathetic with (mine was "fundamentalism"). But it was doing it, rather than following along as someone else did it, that made the difference for me. I also used the standards to evaluate what I'd come up with. Even after all the years of working with the elements and standards as part of teaching, it was still surprising to me that I could gain so much insight by using them myself. When I used the elements to analyze something that really mattered to me, something big and unwieldy, it almost always gave me insight. It made me see aspects of the issue I had never thought of before. I know of many "methods" for engaging in CT, but in my experience none of them ever allowed me to think through such a vast array of my own life, academic as well as personal, and to do so in such a deep and pervasive way.

Not surprisingly, at least in retrospect, this is also what works best in getting my students to start taking CT seriously. I ask them to work on something in their life—something difficult or troubling—and analyze it using the elements. They can sometimes do this pretty well even with only a minimal familiarity with the elements themselves. This does a lot of the motivational work with students. It makes a good bridge to asking them to use the elements to think through course content.

I think that in many ways the philosophy-based, argument-based model I had of CT is still with me. It works as both a profound asset and a serious impediment to furthering my understanding, use, and teaching of CT. My guess is that all disciplines bring analogous assets and impediments to CT. I remember again that I am still in the process of evolving as a theoretician of critical thinking. I can see on the horizon important concepts and dimensions of CT I have not yet recognized, integrated, or absorbed. For me right now, those include making cognitive *processes* more clear and coherent (not just clarification, analysis, and evaluation—and certainly not just the processes in Bloom's new taxonomy—but also more pervasive ones such as *acting thoughtfully* and *living thoughtfully*); contextualizing the elements, standards and traits to specific disciplines: (Hawkins, Elder & Paul, 2010; Paul, Niewoehner, & Elder, 2007**)** working on ways to motivate students (and others) to develop their reflective thinking and their intellectual engagement; and, as always, how to integrate CT more fully into my life and to figure out steps and structures for helping to make the world at large a more reasonable one. It is actually one of the joys of CT that it opens so many new areas to ponder and maybe work out.

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Footnotes

1. I want to thank Frank Fair for the idea of having a series of *INQUIRY* devoted to personal reflection on critical thinking across the disciplines and inviting me to contribute. I also want to express my appreciation to Sam Houston State University for bringing us *INQUIRY* when it looked to be lost forever. For the ideas in my personal reflection, I want especially to thank Richard Paul, Linda Elder, Matthew Nosich, and Francis Coolidge. I gave a version of this paper at Oxford in September, 2008.
2. Though I'm not quite sure of the numbers, by the end of the fifth year of the philosophy program, about half the students had left the program, scared off from even taking the intimidating qualifying exam that entitled you to begin a dissertation; 15 students, after two years of graduate study, took the un-repeatable four-day-long qualifying exam, and 13 failed.
3. I certainly don't mean this of all students. Some individual students were outstanding, including several who went on to become eminent professional philosophers, whose thought and work I respect, admire and learn from. They usually came into my course already having a liking and an ability for "doing philosophy." I believe that my class did help them deepen and sharpen what they were already good at.
4. Of course, strictly this isn't always true, and it depends heavily on how I judge a conclusion to be interesting.

5. Here's the only one I can find, and it just turns on an unusual meaning of one word: "The 'tail' of a comet always points away from the sun. Therefore, when a comet is traveling away from the sun, it is preceded by its tail." The gloss on it explains that the less dense gases in the tail are blown farther by the solar wind, and there is no air resistance to make them lag behind. Gerald Nosich, *Reasons and Arguments*, p 28.
6. The theory and analysis of both informal logic and argumentation have, of course, made great strides since then. But I am writing about my own personal experience of a past time.
7. There is a good deal more to Paul's articulation of CT than I am spelling out here. I am focusing on the "event" that transformed my view of CT.

Author's Biography

Dr. Gerald Nosich has given more than 200 workshops on all aspects of teaching for critical thinking and is an associate of the Center and the Foundation for Critical Thinking. He is the author of *Reasons and Arguments* (Wadsworth, 1982). His second book, *Learning to Think Things Through: A Guide to Critical Thinking Across the Curriculum*, has been translated into Spanish, Chinese, and Arabic.

Dr. Nosich has given workshops for instructors at all levels of education, in the US, in Canada, Thailand, Lithuania, Austria, Germany, the United Kingdom, and Singapore. He has been Assistant Director at the Center for Critical Thinking at Sonoma State University, worked with the U.S. Department of Education on a project for a National Assessment of Higher Order Thinking Skills; given teleconferences sponsored by PBS and Starlink on teaching for critical thinking within subject-matter courses; served as a consultant/evaluator for SACS Accreditation of programs at various colleges and universities emphasizing critical thinking; and been featured as a Noted Scholar at the University of British Columbia. He is the author of numerous articles, audio- and videotapes on critical thinking. He is a professor at Buffalo State College and Professor Emeritus at the University of New Orleans and email address is nosichgm@buffalostate.edu.