

PROFESSIONAL READINGS FROM TC²

Bringing critical thinking to the main stage

By Roland Case

The idea of critical thinking is not new. For decades it has been recognized as an important educational goal by practitioners and theorists alike. The current curriculum document mentions it and there is universal agreement about the need to make thoughtful judgments in virtually every aspect of our lives—from who and what information to believe, to what products would better meet our needs, to which options we should pursue, and so on. Despite this widespread and long-standing recognition, the extent and manner of teaching for critical thinking in schools is disheartening. As I have argued elsewhere, the rhetoric greatly outstrips practice.¹ The depressing irony is that thinking critically is much valued yet addressed in many classrooms. As Walter Parker teaching of thinking remains “more wish than practice.”²

Although numerous factors contribute to this regrettable state of affairs, three reasons are especially influential in relegating critical thinking to a sideshow on the educational agenda:

- *Proliferation of thinking ‘skills.’* There is a plethora of so-called thinking skills. For example, an ASCD publication identifies eight thinking processes (including problem solving, decision making and research) involving 21 core thinking skills (including defining goals, setting goals, inferring, and predicting).³ As long as critical thinking remains but one type among many forms of thinking, there will never be adequate time devoted to critical teaching.



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- *The ranking of thinking skills.* This proliferation deficit is compounded by the fact that critical thinking is designated as ‘higher order thinking,’ which means that it is further up the chain in complexity, and presumably requires mastery of ‘lower order thinking’ before it can be introduced to students. In the Ontario curriculum, for example, the Applied courses intended for non-academic students are distinguished from Academic courses not by the content addressed but by the level of thinking expected of students. As one report noted, the Applied curriculum writers use “lower order verbs,” changing student expectations from, for example, “interpret” to “describe” or from “explore” to “record.” The inference drawn is that the curriculum writers presume that “Applied students cannot think ... [and] are, therefore, relegated to simple tasks like reading and repeating.”⁴ In short, not only are there many thinking skills vying for classroom attention, but critical thinking appears to at the end of the list, often reserved solely for the best students.
- *Separation of ‘skills’ from content.* The teaching of critical teaching and for that matter of most so-called thinking skill is generally divorced from the teaching of subject matter. In many classrooms, especially in high schools, covering curriculum content is seen as the priority. Thinking skills, and particularly critical thinking, are addressed only after the subject matter has been taught. The tendency is to front-end load content and wait until the end of a unit to invite students to reflect on the ideas. Because of the heavy

course load and the content focus of high stakes tests, many teachers find themselves with little time to involve students in thinking about and with this content. Even when critical thinking is addressed in classrooms, if it is separated from subject matter, it is typically taught as a generic skill that students are expected (on their own) to apply to their schooling and everyday life. In short, critical thinking is often ignored or marginalized.

Our scholarly research and professional work with thousands of Canadian teachers through The Critical Thinking Consortium⁵—or TC² for short—has convinced us that critical teaching can assume a rightfully central place on the main stage of classroom activity. We start from the premise that critical thinking is not simply an important goal, but more importantly a powerful method of teaching all other aspects of the curriculum—both content and skill. We help teachers see how inviting students to think critically about subject matter is effective at promoting understanding of the content and mastery of the skills. Students who receive information in a passive or transmissive manner are far less likely to understand what they have heard or read about than are students who have critically scrutinized, interpreted, applied or tested this information. Rather than compete with the teaching of subject matter and other thinking skills, critical thinking supports their development.

The two distinguishing features of our conception⁶ are a *curriculum embedded* approach and an emphasis on *teaching the intellectual tools* required for critical thinking.

A curriculum-embedded approach

Our approach to embedding critical thinking is to help teachers learn to present questions or tasks that challenge students to reflect critically about the curriculum content and skills. We dispute the view that critical thinking is a generic set of skills or processes to be developed independent of content and context. Nor do we believe that critical thinking can adequately be addressed as an add-on to the curriculum. Rather, if it is to take a central place in the curriculum, critical thinking must be seen as a way of teaching the curriculum. The traditional “content/process” division is based upon a false dichotomy: thinking without content is vacuous and content acquired without thought is mindless and inert. As Richard Paul notes, “one gains knowledge *only* through thinking.”⁷ Teachers can help students understand the subject matter, as opposed to merely recall it, by problematizing the subject matter. As John Dewey wrote in *How we Think*, only when a routine is disrupted by the intrusion of a difficult obstacle or challenge are we forced to think about what to do. A ‘critical challenge’ is the term we use to describe a problematic situation that invites students to think critically. If a situation is *not* problematic (i.e., there is only one plausible option or a correct answer is obvious) then it does not call for critical thinking. Without altering the resources used or changing their classroom structure, teachers are encouraged to challenge students in this way. For example, instead of asking students to locate information to answer the factual question “What did the Inuit traditionally use to make tools?”, the teacher might ask students to use this information to decide “Which animal—the seal or the caribou—contributed more to traditional Inuit life?” Similarly, instead of writing a report on a famous scientist, students would assess whether da Vinci,

Newton or Einstein, had the greatest scientific mind. Instead of simply picking a title that students would like for their paragraph, students would decide which of several options was the most informative and engaging.

In all these cases, students go beyond locating facts or espousing a personal preference. They are not merely reporting what they know or like but are offering a judgment or assessment among possible options, determining which would be the more reasonable/wiser/more justifiable choice. In making thoughtful assessments (or reasoned judgments), we must inevitably resort to criteria. We require some basis other than our potentially narrow preferences and whims for selecting one option over another. For example, in deciding whether or not ice cream ought to be part of our diet, we would want to go beyond whether we personally liked the food and consider whether it was nutritious, affordable, readily available, and easy to keep. This larger set of factors forms the criteria involved in making a reasoned judgment on the merits of including ice cream in our diet.

The close relationship between the term “critical” thinking and “criteria” is instructive. Mathew Lipman suggests that the word ‘critical’ should be seen as a synonym for ‘criterial’—to think critically is to think in light of or using criteria.⁸ To put it another way, grounding in criteria gives our judgments rigour. A useful definition of critical thinking is as follows: *To think critically is essentially to engage in deliberations with the intention of making a judgment based on appropriate criteria.* Our job in helping students think critically involves inviting them to consider a reasonably complete and appropriate set of criteria. Left on their own students may judge what should be done in a particular situation on very narrow and dubious

criteria, such as whether it is easy to do and in their immediate self interest. Other criteria might include long-term benefit, fairness to others, consistency with life goals, and safety.

As suggested above, many professional and academic writers contrast critical thinking with a variety of other “forms” of thinking such as decision making or problem solving. According to this view, only certain tasks—those typically referred to as “higher-order” operations—are the domain of critical thinking. It is thought that if students perform “higher-order” operations such as analyzing or synthesizing they are necessarily thinking critically and if students perform so-called “lower-order” operations such as comprehending or remembering they cannot be thinking critically. This tendency to equate critical thinking with particular mental operations encourages two undesirable impressions. It suggests, on one hand, that teachers are supporting critical thinking merely by asking students to carry out tasks involving analysis, interpretation or other “higher-order” operations, and, on the other hand, that there is no role for critical thinking in the so-called “lower-order” operations.

Whether or not students are thinking critically depends more on the qualities that characterize their thinking as they carry out the task, than on the specific nature or type of mental operation. The mere fact that students are analyzing does not mean they are doing it critically. If students blindly accept dubious assumptions, leap to fallacious conclusions and rely on inaccurate statements we would be hard pressed to describe their “analysis” as exhibiting critical thinking. Conversely, so-called “lower-order” operations such as comprehending or remembering can be occasions for critical thinking. Trying to understand a difficult text or lecture is not a rote transfer of information but may involve

elaborate and thoughtful recourse to decoding strategies, habits of mind and background knowledge. So too, with remembering. Many of us with poor memories have likely experimented with various strategies—using mnemonics, keeping lists, making mental notes, repeating the idea several times and so on. If we did not whimsically adopt or reject these approaches but, however informally, assessed them for their reliability, ease of use, and broad application we were thinking critically about remembering. As these examples suggest, the so-called “higher order” operations can be done in a rote and thoughtless way and the so-called “lower order” operations can be done in a critically thoughtfully manner.

To generalize the point, critical thinking should not be tied to any particular category of mental operation but be seen to refer to a quality of thinking (more accurately, to a set of qualities) that may or may not be evident in any particular intellectual task (e.g., analyzing, inferring, interpreting). Teachers can engage students in thinking critically regardless of the type of intellectual task (provided it is in some way problematic so that a judgment among options is possible).

In contrast to the many *types* of thinking classification which distinguishes critical thinking from other so-called forms of thinking and the two *levels* model which distinguishes a few “higher order” operations, we believe that thinking critically is a way of engaging in virtually any task that students undertake in school, provided the thinker attempts to judge what would be reasonable or sensible to believe or do. This explains why all teachers—from art to zoology and from arithmetic to woodwork—can find the time to help students learn to think critically. As one elementary teacher who had begun working with our approach remarked in her journal: “As I reflect on

critical thinking and what I am learning, I am realizing more and more that critical thinking is a form of teaching, embedded in every aspect of life in the classroom. It doesn't happen in isolation, or in specific subjects, but it permeates the curriculum." Who would want their students to write an essay, paint a picture or, for that matter, take notes in a critically thoughtless way? Of course, success in the particular endeavor will depend on the possession of the tools of good thinking.⁹

Teaching the tools

We offer the notion of intellectual resources or "tools" to explain the development of good thinking. Much of the frustration that teachers experience when attempting to engage students in thinking critically stems from the fact that students often lack the required concepts, attitudes, knowledge, criteria or strategies—in short, they lack the "tools" needed to do a reasonably competent job. It is often assumed that mere repetition will improve students' reflective competence.¹⁰ No doubt some students will improve by repeatedly trying to figure things out for themselves, but most of the rest will be more successful if they are taught the requisite tools for the task.

Although the specific tools depend on the nature of the challenge facing the thinker, promoting critical thinking is largely a matter of helping students master an ever broadening repertoire of five types of intellectual resources:

- *Background knowledge:* knowledge of relevant information about a topic that is required for thoughtful reflection. Although it should be obvious that we cannot think critically about a topic if we know little or nothing about it, many accounts of

critical thinking fail to identify it as one of their building blocks. Instead, there is a presumption that thinking skills or operations are independent of the content areas to which the skills are to be applied. Properly understood, relevant background knowledge is not separate from any skill, but part of what is required to be skilled.¹¹ For this reason, individuals need to acquire information relevant to the range of topics that we want them to be able to think critically about. Presumably this range of topics is (or should be) found in the subject matter of the curriculum. This point speaks strongly for embedding the teaching of critical thinking with the teaching of curricular content.

- *Criteria for judgment:* knowledge of the appropriate criteria or grounds for judging the reasonableness or merits of the options presented by a thinking challenge. To think critically is essentially to engage in deliberations with the intention of making a reasoned judgment. And judgments inevitably are made on the basis of criteria. For this reason, an important category of tool are the range of context-sensitive criteria spanning the diverse intellectual tasks found in the curriculum, from what makes for a good argumentative essay, a sound solution to a business problem or a thoughtful question, to the qualities of a reliable scientific experiment, an accomplished artistic performance or effective lecture notes.
- *Critical thinking vocabulary:* knowledge of the concepts and distinctions that are needed to think about the challenge. Although other tools also refer to concepts, 'critical thinking vocabulary' refers to concepts that expressly address distinctions

foundational to thinking critically—for example, knowledge of the difference between ‘conclusion’ and ‘premise’, ‘cause’ and ‘correlation,’ or ‘cause’ and ‘effect,’ and knowledge of various informal fallacies.

- *Thinking strategies*: knowledge of procedures, heuristics, organizing devices, algorithms and models that may be useful when thinking through a challenge. Good critical thinkers draw upon a great variety of strategies to work their way through the challenges facing them. This category of tools is most closely aligned with what others call skills, although we believe they are more responsibly viewed as strategies. Thinking strategies may be very elaborate, such as following a comprehensive decision-making model (for example, when tackling a complex problem begin by identifying the issue, then consider the consequences, research each option, and so on). Alternatively they may be very focused strategies addressing a specific task (for example, to gain clarity about a statement rephrase it in your own words, ask others for clarification or graphically represent the problem). There are literally thousands of strategies that guide individuals in working through the challenges they encounter.
- *Habits of mind*: commitments to the range of values and principles of a

careful and conscientious thinker. Although more commonly described as dispositions, we prefer the term ‘habits of mind’ to refer to the intellectual ideals or virtues to which a careful and conscientious thinker will be committed. These intellectual virtues orient and motivate thinkers in habitual ways that are conducive to good thinking, such as being open-minded, fair-minded, tolerant of ambiguity, self-reflective and attentive to detail.

The “tools” in action

The pedagogical value of conceiving of critical thinking as the competent use of contextually relevant tools is best seen through examples of teachers attempting to help their students work through particular critical thinking challenges.

Teaching the tools

An important function of the tools approach is to help teachers identify what students need to be taught in order to undertake a given task in a critically thoughtful manner. To illustrate the instructional value of our model, I examine two examples of teaching students the tools needed to ask effective questions. I begin with teaching primary students to think critically about developing "powerful" questions.

Developing powerful questions¹²

As part of their social studies curriculum, Tami McDiarmid's kindergarten to grade three class was to learn about the significance of Remembrance Day (November 11). In fostering appreciation of this event, Tami invited her students to think of questions they might ask of a classroom guest who was to speak about his World War II experiences. Left to their own devices, many students would likely have asked rather trivial or irrelevant questions. Tami sought to support her students in thinking critically about the questions they might ask by focusing their attention on four tools: some critical thinking vocabulary, criteria for judgment, a thinking strategy, and background knowledge.

A few days prior to the visit, Tami re-introduced key vocabulary by reminding her students that they had previously talked about two kinds of questions: “weak” questions and “powerful” questions. Armed with this distinction, the class discussed what powerful questions “look like or sound like”—or, to use our terminology, they discussed the criteria for judging powerful questions. Tami recorded on chart paper the following student-generated criteria:

Powerful questions . . .

- *give you lots of information*
- *are specific to the person or situation*
- *are open-ended—can't be answered by yes or no*
- *may be unexpected*
- *are usually not easy to answer*

Next, Tami made use of a thinking strategy—that of brainstorming—which her students had already learned to use. Brainstorming is a useful strategy to help with the generation of ideas. In itself, it does not invoke critical thinking. In fact, while brainstorming, individuals are discouraged from making judgments about the proffered ideas—the point is simply to generate as many ideas as possible. The critical thinking began in earnest when students, working in pairs, began to assess the brainstormed questions. Using the agreed-upon criteria as their guide, students discussed whether or not their proposed questions were likely to elicit lots of information, were obvious or predictable, and so on. Some “weak” questions were rejected; others were modified to make them more powerful.

Tami had developed a fourth tool—that of relevant background knowledge—during the three weeks preceding the guest's visit by reading and discussing various children's stories involving the war. Without the knowledge acquired from these stories, many students would have been incapable of asking a thoughtful question.

Here are a sampling of the student-generated questions asked of the World War II veteran:

- *Why did you fight in the war?*
- *Do you remember some of your friends from the war?*
- *Which countries did you fight over?*
- *Where did you live during the war?*
- *Were there any women in World War II? If so, what were their jobs?*
- *What started the fighting?*
- *Why was Canada involved?*
- *What was your safe place?*

In this example, Tami systematically aided her primary students in thoughtfully constructing questions by teaching four tools. Notice, *teaching* the tools is not the same of as giving students the answers or doing the thinking for them. Tami did not indicate to students the questions they might ask; rather she helped them develop the intellectual resources they

needed to thoughtfully complete the task for themselves. Not only was these students' ability to pose powerful questions aided by the tools their teacher helped them acquire, but their understanding of the subject matter—in this case the significance of Remembrance Day—was enhanced by the experience.

Developing examination questions¹³

Karen Barnett, a junior high humanities teacher, borrowing an idea from a fellow teacher, Bob Friend, had her students *create* not simply answer exam questions. Their task was to prepare an end-of-unit quiz consisting of six questions and an answer key focussed on their study of 17th century England. In supporting her students in this task, Karen provided three tools: background knowledge, criteria for judgment and a thinking strategy.

The required background knowledge—knowledge of the focus of the questions—was acquired by reading the relevant chapter in their textbook and by undertaking a variety of related assignments. When framing their six questions, students were instructed to consider four criteria:

- must be clear so that fellow students will understand what is required;
- should address a non-trivial aspect of the contents of the chapter;
- can be answered within a half page (or twenty minutes);
- must require more than mere recall of information.

Karen further supported her students' efforts by offering a thinking strategy—the use of “question frames”—to help generate questions that went beyond mere recall of information. More specifically, students were invited to frame questions using prompts such as the following:

- Compare . . . with . . .
- What conclusion can be drawn from . . .
- Decide if . . . was correct when . . .
- Predict what would have happen if . . .
- What was the effect of . . .
- Decide which choice you would make if . . .

A list of the best student-generated questions was distributed to the class well before the test. Students were informed that their test would be drawn exclusively from their questions. The following questions were submitted by one of the students in Karen's class:

1. *Compare the ideas of Thomas Hobbes and John Locke on government.*
2. *Do you think Cromwell was correct in chopping off the king's head, and what advantage did government gain over royalty because of this?*
3. *What were the effects of the civil war on the monarchy and the peasantry of the country?*
4. *If you were the king how would you handle the pressures of government and the people?*
5. *Compare the power of the government in the early 1600's to the power it has today.*
6. *What do you think would have happened if the people hadn't rebelled against the king?*

We can see the contextual nature of the tools involved in posing effective questions by contrasting the two situations. The required background knowledge in one case was knowledge of World War II; in the other, it was knowledge of the civil war period in 17th century England. Karen's sample "question frames" offered a thinking strategy—a complementary strategy to brainstorming—to help students generate questions. Karen's articulation of the criteria—different from the criteria offered in the primary class—focused students' thinking on the features of good examination questions.

Significantly, teaching students to think critically about the questions they posed contributed to their understanding of the subject matter. The criteria that Karen set—notably that student ask non-trivial questions—required students to think about what was important about the historical period. So too, did her inclusion of student-generated questions on the unit test. Since these questions went beyond mere recall of information, studying for the test required that other students think about the issues raised. Karen insists that had she posed the very questions her students had produced, she would have been bombarded with complaints: "How do expect us to know this? You never told us the answers to this!" Instead, not only did students take seriously the assignment to create the questions—in some cases reading the textbook for the first time—they were more motivated to study for the test since the questions were posed by their peers.

This last point—the motivational value of critical thinking—is an important one. Although not all students will welcome opportunities to think critically, more often than not, students prefer to think about matters than to regurgitate facts or apply undigested ideas. This is

especially true when the issues or topics students are asked to think critically about are meaningful to them.

Assessing the tools

Thus far I have focused on teaching the tools. Another useful feature of the tools approach is the parallel between instruction and assessment. Assessment is a major obstacle for many teachers in their efforts to promote critical thinking. If there is no single correct answer to look for in student responses, it is often difficult to know what to assess. As our last two examples illustrate, students might pose any of a near infinite number of effective questions. Does this mean that virtually any question is acceptable? If not, on what basis should we assess these questions?

The topic of assessment of critical thinking deserves more space than is available here. Let me say simply that the key consideration is not whether we agree or disagree with the conclusions students reach but with the quality of the thinking that supports their answers. In assessing critical thinking we should look for evidence that students' answers competently embody the relevant tools. It may be unrealistic to assess students on the complete range of tools that a particular task requires. A more appropriate approach is to assess only those tools that students were expressly expected to employ in the task before them. In other words, we should endeavor to assess the tools that the students were instructed to use. Returning to the two examples of teaching students to pose effective questions, let us see what this looks like in practice.

Assessing thinking about powerful questions. In learning to pose powerful questions to the war veteran, the

primary students were expressly taught four tools, all of which might form the basis for assessing students' thinking. The actual questions could be evaluated on two criteria:¹⁴ the criteria for judgment and background knowledge about World War II. We could assess the former by looking to see how well the question each student posed met the agreed-upon criteria. (Alternatively, students might be asked to explain how their question satisfies each criterion). Students' questions could be used to assess background knowledge by looking to see whether or not any question reveals factual errors. The teacher could circulate among the groups assessing use of the brainstorming strategy by observing if students readily volunteered questions and accepted all suggestions without criticism. Students' understanding of the conceptual distinction between weak and powerful questions could be assessed by providing sample questions and asking students to identify which were weak and which were powerful questions.

Assessing thinking about test questions. In the second example, students were provided with three tools to support their thinking about examination questions: a range of criteria for effective test questions, the "question frame" strategy for generating questions and background knowledge on the historical period. The student-generated questions could be assessed on all three grounds: how well they satisfied the stipulated criteria for judgment, the extent to which the questions represent a variety of question frames and, to a lesser extent, on the knowledge of the period implied by the questions asked. (A more appropriate source for assessing students' background knowledge would be the answer key that was to accompany each student's six questions.)

Since the focus of the second example was on posing test questions, we

made no mention of the tools needed to help students think critically about their answer key (and, by implication, about their answers on the actual end-of-unit quiz). It would be instructive to briefly consider what these tools might be. Obviously, there is no definitive list of tools to teach students to answer exam questions thoughtfully. Often, the identified tools depend on the teacher's priorities for the assignment, the perceived needs of the students and the demands of the curriculum. Consequently, my suggestions are just that. I do think, however, that there will be considerable agreement on the sorts of tools that we would recognize as being appropriate.

A useful place to begin thinking about which tools to assess is to imagine a weak student response to a sample question (poor responses are often more revealing). Using the question, "What do you think would have happened if the people hadn't rebelled against the king?", consider the following obviously flawed answer: "If the people hadn't rebelled they would have quickly forgotten their troubles and gone back to watching television."

What relevant tools appear to be absent in this answer? The historical error of assuming the existence of television in the 17th century comes immediately to mind. Or, to put it in our terminology, the background knowledge is incomplete. The bald assertion that the citizenry would quickly forget their problems is vague, somewhat implausible and is not supported with any evidence. These deficits suggest gaps in understanding the criteria for judging a thoughtful response.

The historical error about watching television might suggest stressing the need for students to read the chapter carefully. In addressing the gaps in criteria for judgment, we might explore with students the importance of a detailed

(or specific) answer, that it be plausible and amply supported by evidence (or reasons). The specification of these three criteria for judgment might raise the need to teach critical thinking vocabulary: all students would not know the difference between *plausible* and *actual* outcomes. (An outcome need not be actual, or even likely, for it to be plausible.) We might also try to nurture an *empathic* habit of mind. Empathy, and in this particular case historical empathy, involves an appreciation of how others in different situations and contexts might feel about an event. If students were inclined to put themselves, metaphorically speaking, into the heads and hearts of those living in the 17th century, their answers to the questions might be more detailed and plausible. In casting about for thinking strategies to help students construct a thoughtful answer we might recommend a “template” for their answers. Perhaps, students might employ a three-point outline: 1. Briefly summarize the position taken; 2. Elaborate on what is meant or implied by the position; and 3. Offer several pieces of evidence to justify the position.

We might imagine other hypothetical student answers, including ideal answers to help us elaborate upon

and refine our list of requisite tools. For example, our imagined exemplary answers might include refutation of possible objections to the stated position, or suggested alternative positions and evaluations of the relative merits of each. If we thought these were reasonable and appropriate expectations we might introduce additional tools, including teaching the concepts of ‘argument’ and ‘counter-argument’ and revising the suggested three-point outline to add a new step—4. Anticipate possible objections to their position and provide a counter-argument for each. Needless to say there are other possibilities for tools to teach and, in turn, to assess. The point to appreciate is how varied the tools and much better students’ answers will likely be if they have been taught some of these tools.

As these example suggest, embedding critical thinking in the teaching of subject matter and skills has a double-edged benefit: students are more likely to master the curriculum outcomes that we want them to learn, and critical thinking will finally occupy the prominent role in elementary and secondary classrooms that it deserves.

¹ Roland Case and Ian Wright, “Taking seriously the teaching of critical thinking,” *Canadian Social Studies*, 32, 1 (1997): 12-19.

² Walter Parker, “Achieving thinking and decision-making objectives in social studies” in *Handbook of research on social studies teaching and learning*, ed. J. Shaver (Toronto: Collier Macmillan, 1991) 345-356.

³ R.J. Marzano, R.S. Brandt, C.S. Hughes, B.F. Jones, B.Z. Pressisen, S.C. Rankin and C. Suhor, *Dimensions of thinking: A framework for curriculum and instruction* (Alexandria, VA: Association for Supervisions and Curriculum Development, 1988).

⁴ Fabrizio Antonelli, *From applied to applause* Toronto: Ontario Secondary School Teachers’ Federation, November 2004) 33, 35.

⁵ TC² was founded in 1993 in British Columbia to provide long-term sustained support for critical thinking. Since that time, TC² worked with over 25,000 educators and its institutional membership has grown to 42 school districts, faculties of education and

other educational organizations across Canada. It supports an affiliate network of schools in India and has begun working with schools in the United States.

⁶ This conception was developed initially in collaboration with Jerrold Coombs, LeRoi Daniels and Sharon Bailin. See S. Bailin, *et al.*, *A conception of critical thinking for curriculum, instruction and assessment* (Victoria, BC: Examinations Branch, Ministry of Education, September 1993) and S. Bailin, *et al.*, “Conceptualizing critical thinking,” *Journal of Curriculum Studies* 31, 3 (1999): 285-302.

⁷ Richard Paul, “The logic of creative and critical thinking” in R. Paul, *Critical thinking: How to prepare students for a rapidly changing world*, (Santa Rosa, CA: Foundation for Critical Thinking, 1993) 277.

⁸ M. Lipman, “Critical thinking: What can it be?” *Educational Leadership* 45, (1988).

⁹ Although I focus in this article on the curricular contexts for teaching the tools, critical thinking cannot be learned independently of the broader forces operating within the classroom and the school. Consequently, it is essential to foster “critical” communities where teachers and students interact in mutually supportive ways to nurture critical reflection. The point of a critical community is to create an environment, or climate, that embodies and reinforces the tools of thought.

¹⁰ Typically, educators are encouraged to engage students in repeated practice of these “skills” across a variety of contents. For example, L.E. Raths, S. Wassermann, A. Jonas and A. Arnold, *Teaching for thinking: Theory, strategies, and activities for the classroom* (New York: Teachers College Press, 1986), p. xiv, unequivocally state: “Here, then, is the first principle upon which a teaching for thinking program is based: *Children need to spend many, many hours practicing higher-order thinking skills if they are to become successful thinkers*” [Emphasis in original].

¹¹ Consider the example of teaching students the so-called operation of analysis. We cannot effectively teach students *the* process or skill of analyzing for the simple reason that analysis of, say, a poem for its meter, rhyme and symbolism poses a significantly different challenge than that posed by the analysis of an ore sample for its chemical properties. Although a few strategies may be shared in both forms of analysis (for example, it may be helpful to follow procedures such as isolating each discrete part, and listing the features or characteristics of each), recognizing what these strategies imply presupposes relevant background knowledge in poetry and chemistry. Without knowledge of the color, density and composition of relevant minerals and trace elements, students have no skill in analyzing ore samples.

¹² This example is based on a lesson described in T. McDiarmid, R. Manzo and T. Musselle, *Critical challenges for primary students* (Vancouver: The Critical Thinking Cooperative, 1999), pp. 57-59.

¹³ Based on personal communication with Karen Barnett.

¹⁴ Notice my use of criteria in two contexts: I talk about *assessment criteria* and *criteria for judgment*. Assessment criteria are the grounds for assessing student’s work and, in the area of critical thinking, we recommend using all five tools as sources of assessment criteria. This implies that the tool we refer to as criteria for judgment is but one of the criteria that may be used to assess critical thinking.