Appendix A

Introduction to the TC2 Conception of Critical Thinking

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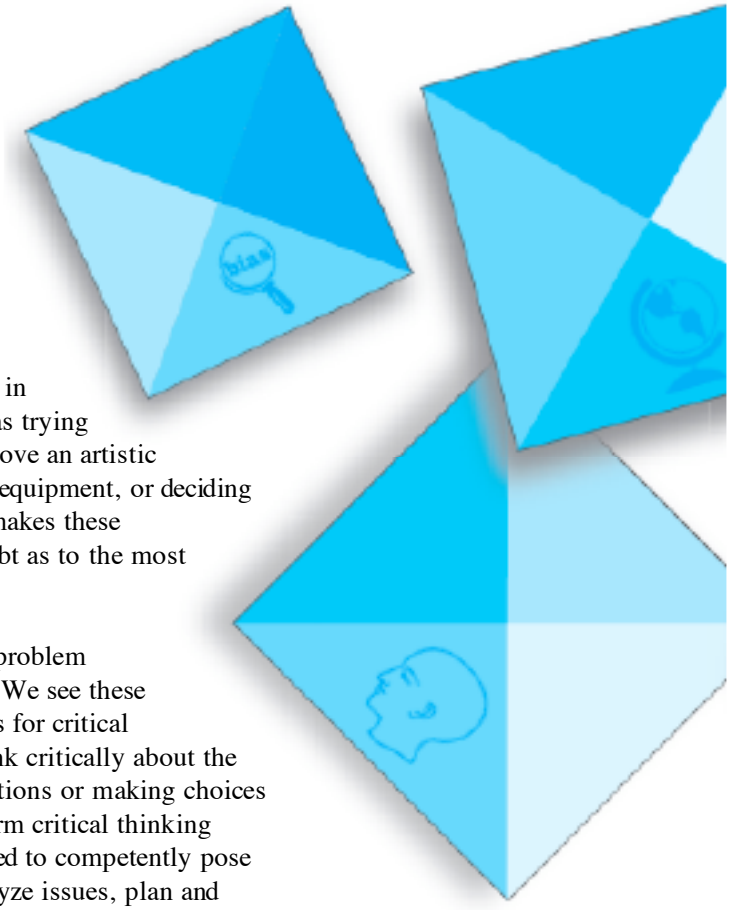
Understanding critical thinking



Critical thinking involves thinking through problematic situations about what to believe or how to act where the thinker makes reasoned judgments that embody the qualities of a competent thinker.

A person is attempting to think critically when she thoughtfully seeks to assess what would be sensible or reasonable to believe or do in a given situation. The need to reach reasoned judgments may arise in countless kinds of problematic situations such as trying to understand a passage in a text, trying to improve an artistic performance, making effective use of a piece of equipment, or deciding how to act in a delicate social situation. What makes these situations problematic is that there is some doubt as to the most appropriate option.

Critical thinking is sometimes contrasted with problem solving, decision making, analysis and inquiry. We see these latter terms for rational deliberation as occasions for critical thinking. In all these situations, we need to think critically about the options. There is limited value in reaching solutions or making choices that are not sensible or reasonable. Thus, the term critical thinking draws attention to the quality of thinking required to competently pose and solve problems, reach sound decisions, analyze issues, plan and conduct thoughtful inquiries and so on. In other words, thinking critically is a way of carrying out these thinking tasks just as being careful is a way of walking down the stairs. Thus, thinking critically is not a unique *type* of thinking that is different from other types of thinking, rather it refers to the *quality* of thinking. The association of critical thinking with being negative or judgmental is misleading, since the reference to critical is to distinguish it from uncritical thinking—thinking that accepts conclusions at face value without any assessment of their merits or bases. It is more fruitful to interpret critical in the sense of critique—looking at the merits and shortcomings of alternatives in order to arrive at a reasoned judgment.

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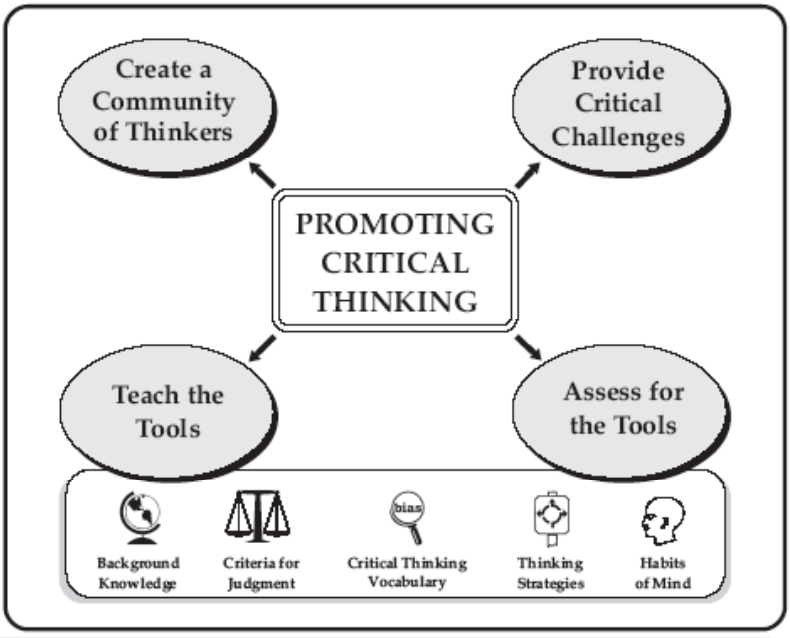
Our focus on the quality of thinking does not imply that students must arrive at a preconceived right a ing

in a given situation. For example, it wouldn't matter whether students opposed or supported a position expressed in a newspaper or textbook. Regardless of their particular position, we would want students' critically thoughtful responses to exhibit sensitivity to any bias, consideration of alternative points of view, attention to the clarity of key concepts, and assessment of supporting evidence. We believe that emphasis on qualities that student responses should exhibit focuses teachers' attention on the crucial dimension in promoting and assessing students' competence in thinking critically. The challenge for teachers is to adopt practices that will effectively promote these qualities in their students.

Promoting critical thinking

To help students improve as critical thinkers, we propose a four-pronged approach:

- build a *community of thinkers* within the school and classroom;
- infuse opportunities for critical thinking—what we call *critical challenges*—throughout the curriculum;
- develop the *intellectual tools* that will enable students to become competent critical thinkers;
- on a continuing basis *assess students' competence* in using the intellectual tools to think through critical challenges.



Building a community of thinkers

Developing supportive school and classroom communities where reflective inquiry is valued may be the most important factor in nurturing critical thinking. Many of the intellectual resources, or "tools" of critical thinking will not be mastered by students unless their use is reinforced on an ongoing basis. As well, the image of the thinker as a solitary figure is misleading. No one person can perfectly embody all the desired attributes—we must learn to rely on others to complement our own thoughts. There are many routines and norms that teachers can adopt to create a community of thinkers:

- Regularly pose questions and assignments requiring students to think through, and not merely recall, what is being learned.

- Creating ongoing opportunities to engage in critical and cooperative dialogue—confer, inquire, debate and critique—is key to creating a community of thinkers.
- Employ self- and peer-evaluation as ways of involving students in thinking critically about their own work.
- Model good critical thinking practices. Students are more likely to learn to act in desired ways if they see teachers making every effort to be open-minded, to seek clarification where needed, to avoid reaching conclusions based on inadequate evidence, and so on.

Infusing critical challenges throughout the curriculum

If students are to improve their ability to think critically, they must have numerous opportunities to engage and think through problematic situations—what we refer to as *critical challenges*.

- *Does the question or task require judgment?* A question or task is a critical challenge only if it invites students to assess the reasonableness of plausible options or alternative conclusions. In short, it must require more than retrieval of information, rote application of a strategy, uninformed guessing or mere assertion of a preference.
- *Will the challenge be meaningful to students?* Trivial, decontextualized mental exercises often alienate or bore students. It is important to frame challenges that are likely to engage students in tackling questions and tasks that they will find meaningful.
- *Does the challenge address key aspects of the subject matter?* Critical thinking should not be divorced from the rest of the curriculum. Students are more likely to learn the content of the curriculum if they are invited to think critically about issues embedded in the subject matter.
- *Do students have the tools or can they reasonably acquire the tools needed to competently address the challenge?* Students need support in acquiring the essential tools required to competently meet the critical challenge.

Developing intellectual tools for thinking critically

The key to helping students develop as critical thinkers is to nurture competent use of five types of tools of thinking. These categories of tools are *background knowledge*, *criteria for judgment, critical thinking vocabulary, thinking strategies* and *habits of mind*.

 **Background Knowledge** *—the information about a topic required for thoughtful reflection*	Students cannot think deeply about a topic if they know little about it. Two questions to ask in developing this tool: • What background information do students need for them to make a well-informed judgment on the matter before them? • How can students be assisted in acquiring this information in a meaningful matter?
 **Criteria for Judgment** *—the considerations or grounds for deciding which of the alternatives is the most sensible or appropriate*	Critical thinking is essentially a matter of judging which alternative is sensible or reasonable. Students need help in thinking carefully about the criteria to use when judging various alternatives. • Is my estimate *accurate*? • Is the interpretation *plausible?* • Is the conclusion *fair* to all? • Is my proposal *feasible*?
 **Critical Thinking Vocabulary** *—the range of concepts and distinctions that are helpful when thinking critically*	Students require the vocabulary or concepts that permit them to make important distinctions among the different issues and thinking tasks facing them. These include the following: • inference and direct observation; • generalization and over generalization; • premise and conclusion; • bias and point of view.
 **Thinking Strategies** *—the repertoire of heuristics, organizing devices, models and algorithms that may be useful when thinking through a critical thinking problem*	Although critical thinking is never simply a matter of following certain procedures or steps, numerous strategies are useful for guiding one's performance when thinking critically: • *Making decisions:* Are there models or procedures to guide students through the factors they should consider (e.g., a framework for issue analysis or problem solving)? • *Organizing information:* Would a graphic organizer (e.g., webbing diagrams, Venn diagrams, "pro and con" charts) be useful in representing what a student knows about the issue? • *Role taking:* Before deciding on an action that affects others, should students put themselves in the others' positions and imagine their feelings?
 **Habits of Mind** *—the values and attitudes of a careful and conscientious thinker*	Being able to apply criteria and use strategies is of little value unless students also have the habits of mind of a thoughtful person. These include: • *Open-minded:* Are students willing to consider evidence opposing their view and to revise their view should the evidence warrant it? • *Fair-minded:* Are students willing to give impartial consideration to alternative points of view and not simply impose their preference? • *Independent-minded:* Are students willing to stand up for their firmly held beliefs? • *Inquiring or "critical" attitude:* Are students inclined to question the clarity of and support for claims and to seek justified beliefs and values?

Assessing for tools

Assessment is an important complement to the teaching of the tools of critical thinking. As suggested by the familiar adages "What is counted counts" and "Testing drives the curriculum," evaluation has important implications for what students consider important and ultimately what students learn. Evaluations that focus exclusively on recall of information or never consider habits of mind fail to assess, and possibly discourage, student growth in critical reflection.

A key challenge in assessing critical thinking is deciding what to look for in a student's answer. If there is no single correct response, we may well ask: "On what basis, then, can we reliably assess students?" In the case of critical thinking, we would want to see how well students exhibited the qualities of a competent thinker. Thus, the intellectual resources or tools for critical thinking become the criteria for assessing students' work. The following example suggests each of the five types of critical thinking tools and specific assessment criteria that might be considered when evaluating critical thinking in an argumentative essay and an artistic work.

Type of criteria for assessment	Evidence of critical thinking in a persuasive essay	Evidence of critical thinking in an artistic work
Background Knowledge *Has the student provided adequate and accurate information?*	• cited accurate information.	• revealed knowledge of the mechanics of the medium.
Criteria for Judgment *Has the student satisfied relevant criteria for judgment?*	• provided ample evidence; • arranged arguments in logical sequence.	• work was imaginative; • work was clear and forceful.
Critical Thinking Vocabulary *Has the student revealed understanding of important vocabulary?*	• correctly distinguished "arguments" from "counter arguments."	• represented "point of view."
Thinking Strategies *Has the student made effective use of appropriate thinking strategies?*	• used appropriate strategies for persuasive writing.	• employed suitable rehearsal/ preparation strategies.
Habits of Mind *Has the student demonstrated the desired habits of mind?*	• demonstrated an openness to alternative perspectives; • refrained from forming firm opinions where the evidence was inconclusive.	• was open to constructive criticism; • demonstrated a commitment to high quality; • demonstrated a willingness to take risks with the medium.