

## Conceptualizing critical thinking

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In this paper, the second of two, we set out a conception of critical thinking—that critical thinking is a normative enterprise in which, to a greater or lesser degree, we apply appropriate criteria and standards to what we or others say, do, or write. The expression ‘critical thinking’ is a normative term. Those who become critical thinkers acquire such intellectual resources as background knowledge, operational knowledge of appropriate standards, knowledge of key concepts, possession of effective heuristics, and of certain vital habits of mind. We explain why these intellectual resources are needed and suggest that we can best teach critical thinking by infusing it within any curricular practice in which our students are involved.

Judging by the attention given to critical thinking in educational journals and in the official documents of governing agencies, support for teaching critical thinking at all levels of education is extremely strong in North America and the UK. But, agreement about teaching critical thinking persists only so long as theorists remain at the level of abstract discussion and permit their use of the term to remain vague. As soon as they begin to spell out in more concrete terms what critical thinking consists in, what educational attainments are required if one is to be a critical thinker, and what means are likely to be efficacious in teaching persons to think critically, that is to say, as soon as they *interpret* the term in such a way as to provide a clear *conception* of critical thinking, agreement evaporates.

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Thus, theorists whose abstract definitions of critical thinking appear to be roughly similar tend to differ with regard to the language they use in their more concrete conceptions of critical thinking, the range of activities they regard as falling within its ambit, the emphases they give to various aspects of critical thinking, and the kinds of activities they see as relevant to learning to think critically. Moreover, there is considerable debate about which is most adequate and efficacious.<sup>1</sup> Given the vagueness of the concept of critical thinking and the variety of ways critical thinking competence can be described, it would be foolish to suggest that any given conception of critical thinking is *the* correct one. It does not follow from this, however, that all conceptions of critical thinking are equally good or defensible.

Educators need a defensible conception of critical thinking and a perspicuous account of the characteristics or qualities necessary for being a critical thinker. In this paper, we explicate and defend a conception of critical thinking and the critical thinker that we believe provides a firm foundation for the development of curricula and programmes for teaching critical thinking. Despite the fact that some very good work has been done in this area, our experience in working with teachers and curriculum developers convinces us that there are still important improvements to be made in conceptualizing critical thinking for this audience. Although our conception shares several important features with other well-known conceptions, such as those explicated by Ennis (1987), Paul (1990) and Lipman (1991), it also differs from these in important ways, as we shall make clear.

The conception we explicate and defend views competence in critical thinking in terms of intellectual resources. These include background knowledge, knowledge of critical thinking standards, possession of critical concepts, knowledge of strategies or heuristics useful in thinking critically, and certain habits of mind. Before we explain each of these components in detail, it is necessary to make clear the nature of the considerations that lead to such a conception.

### **Developing a conception of critical thinking**

Any defensible conception must construe critical thinking in such a way as to capture most of what people have in mind when they claim that developing critical thinking is an important goal of education. That is to say, it must be true to the core meaning of the educator's basic concept of critical thinking.<sup>2</sup> Should it fail in this regard, it is largely irrelevant to educators concerned with developing critical thinking. What, then, do critical thinking advocates generally have in mind when they talk about critical thinking? Perhaps the best way of approaching this question is to consider what sorts of thinking educators typically would and would not judge to be critical thinking. They would not regard daydreaming, musing and wool-gathering as forms of critical thinking. This suggests that thinking regarded as critical thinking must be directed toward some end or purpose, such as answering a question, making a decision, solving a problem, resolving an issue, devising a plan, or carrying out a project.

Roughly speaking, thinking that serves such purposes can be characterized as thinking aimed at forming a judgement, i.e. making up one's mind about what to believe or do.<sup>3</sup>

Not just any thinking aimed at deciding what to believe or do can count as critical thinking, however. If the thinking is sloppy, superficial, careless, rash or naïve, most advocates of critical thinking would not agree that it is critical thinking. For example, someone who comes to believe on the basis of poor or irrelevant reasons, on the authority of someone whose credibility is questionable, or without attempting to assess the evidence relevant to the truth of the belief, would not usually be regarded as thinking critically. This suggests that thinking about what to believe or do must meet appropriate *standards* if it is to be regarded as critical thinking. Moreover, these standards cannot be met merely by accident or happenstance. If someone were inadvertently to fulfil relevant standards in their thinking, but had not intentionally attempted to fulfil them, they would not generally be regarded as having engaged in critical thinking. To be engaged in critical thinking one must be aware that there are such standards and must be striving to fulfil them. This is not to say, of course, that a person engaged in thinking critically is necessarily able to state or verbally explicate the relevant standards.

To summarize, critical thinking, as it is typically understood by educators, has at least these three features:

- it is done for the purpose of making up one's mind about what to believe or do;
- the person engaging in the thinking is trying to fulfil standards of adequacy and accuracy appropriate to the thinking; and
- the thinking fulfils the relevant standards to some threshold level.

Fulfilling relevant standards in thinking is, of course, not an all or nothing affair. This being the case, we sometimes talk about good and poor critical thinking to indicate the degree of fulfillment of relevant standards. When someone's thinking is very poor we may simply say that the person is not thinking critically,<sup>4</sup> even though he or she may be striving to fulfil the relevant standards.

This basic concept of critical thinking possesses several kinds of vagueness. It is vague with respect to the range of judgements that can be the subject of critical thinking, the nature of the standards that must be met by critical thinking, and the nature of the activities, operations or procedures through which these standards may be fulfilled. Because of this vagueness, developing a conception of critical thinking requires a number of decisions. One important decision concerns how to describe what a person does in thinking critically, i.e. the 'activities' such thinking involves. Currently, popular conceptions suggest three possible choices: following a particular procedure, using specific mental processes, and accomplishing certain intellectual tasks. In our earlier paper in this issue of *JCS*, we argued that critical thinking cannot be adequately described in terms of the use of specific mental processes or the following of a particular procedure. In our view, critical thinking must be described in terms of adequately accomplishing certain intellectual tasks if we are to do justice to the fact

that our basic concept of critical thinking is essentially a normative notion, i.e. that critical thinking is in some sense good thinking. It is the quality of the thinking, not the processes of thinking, which distinguishes critical from uncritical thinking.

In addition to deciding how to describe critical thinking activities and standards, we need to decide the boundaries of critical thinking, i.e. what sorts of tasks we see critical thinking as encompassing. Critical thinking is sometimes contrasted with problem solving, decision making, issue analysis and inquiry. Terms such as 'problem solving' and 'decision making' designate rather general kinds of thinking tasks. But, carrying out these tasks typically requires one to make a number of judgements, and the thinking that leads to these judgements can either fulfil or fail to fulfil relevant standards of good thinking. One may solve a problem in a critical or an uncritical manner. So, problem solving, decision making, etc., are best seen as arenas in which critical thinking should take place rather than as other kinds of thinking to be contrasted with critical thinking.

Some conceptions of critical thinking portray critical and creative thinking as not only different, but mutually exclusive kinds of thinking. We believe there are very good reasons for not adopting such a view. One may be engaged in thinking, the purpose of which is to make up one's mind about what to do in creating a poem, a play or a painting, and at the same time be striving to meet the standards appropriate to such thinking. It is a historical fact that although novel ideas may occasionally arise through accident, for the most part scientific discoveries, technological inventions and artistic performances require the exercise of judgement based on critical thought. In other words, one may think critically while engaged in creative thinking. Similarly, one may need to be creative in thinking critically about problems and issues. Critical thinking often requires imagining possible consequences, generating original approaches and identifying alternative perspectives. Thus, creativity plays an important role in thinking critically.<sup>3</sup>

Some critical thinking theorists have claimed or assumed that critical thinking is best conceived as being limited to the analysis and assessment of statements, arguments or reasons. For example, Johnson (1992: 49) contends that critical thinking involves judging an intellectual product on the basis of appropriate standards (or criteria). The intellectual products he has in mind include beliefs, theories, hypotheses, news stories and arguments. Siegel (1988: 23) has defined critical thinking as involving two components, 'the ability to assess reasons properly' and 'the willingness, desire, and disposition to base one's actions and beliefs on reasons'.

Although evaluation of intellectual products, including statements, arguments and reasons is an important component of critical thinking, to conceive of it as being confined to such activities is overly narrow in two ways. First, it fails to do justice to the fact that good thinking is more than simply good evaluation of intellectual products; it also involves appropriate deliberation or reflection. Persons may fail to think critically, for example, not because they do a poor job of evaluating reasons, but because they do a poor job of finding out what considerations are relevant to their decision, and, thus, what may count as reasons. Similarly, they may fail to think

critically because they neglect to consider plausible alternatives to their initial ideas and inclinations when trying to decide what to do. An adequate conception of critical thinking must construe it as involving both responsible assessment of reasons and arguments, and responsible deliberation.<sup>6</sup>

Secondly, this construal is too narrow, in that it fails to do justice to the fact that critical thinking very often takes place in the context of persons' thinking things through together by means of discussion and dialogue. Popper (1972: 148) has emphasized the importance of critical discussion in the advancement of science. We believe it plays an equally important role in most areas of inquiry and practice, including political and moral decision making.<sup>7</sup> If we are correct in supposing that group deliberation is an important context for critical thinking, then the thinking appropriate to such contexts must be included in our conception of critical thinking. This means that, in addition to assessing intellectual products appropriately, critical thinking will include responding constructively to reasons and arguments given by others in the context of discussion. Responding constructively in such a context involves furthering the point or purpose of the critical discussion, while maintaining a social environment that enables all parties to the discussion to participate fully. Thus,<sup>8</sup> good thinking in this context involves more than good reason-evaluation.

### A conception of critical thinking and the critical thinker

Because critical thinking is, in our view, thinking in such a way as to fulfil relevant standards, it is the standards of good thinking that provide the criteria for determining what attributes are important for critical thinkers. If an attribute is required by persons in order to fulfil a standard of good thinking, or if it will significantly increase the chances that their thinking will fulfil such standards, it can legitimately be regarded as an attribute that should be fostered in a critical thinker.

Attributes of critical thinkers may be described in a variety of ways. For the reasons described above, we avoid conceptualizing the critical thinker in terms that postulate mental or psychological processes and capacities. We also avoid language that is misleading or confusing. It is fairly common to characterize the critical thinker by enumerating a list of skills or abilities and a list of attitudes or dispositions such a thinker must have.<sup>9</sup> This kind of characterization is appealing, because obviously there are certain kinds of things critical thinkers must be able and inclined to do. However, adoption of such language, and in particular the use of the terms 'skills' and 'abilities', has the potential for causing confusion.

The lists of critical thinking skills or abilities offered by critical thinking theorists are necessarily a list of things the critical thinker must be able to *accomplish*, for the only way we have of describing what one is able to do in thinking is in terms of the outcomes generated by the thinking. Thus, we say that the critical thinker must be able to do such things as judge the adequacy of reportive definitions, detect invalid arguments, etc.—meaning the critical thinker must be able to accomplish successfully these tasks.

Such lists imply nothing about the psychological states, capacities or processes that enable critical thinkers to have the requisite accomplishments, and nothing about the kinds of instructional procedures that are likely to be efficacious in bringing them about.

Misunderstanding arises, however, when we begin to describe the items on such a list as 'critical thinking abilities or skills', that is, when we begin to talk about 'the ability to judge reportive definitions' or 'the skill of detecting invalid arguments'. Many educators interpret such ability and skill descriptions as descriptions of psychological processes, states or capacities, rather than as simply descriptions of what persons can accomplish.<sup>10</sup> To avoid the confusion and misunderstanding this psychological interpretation of ability descriptions can generate, we have chosen not to explicate our conception of the critical thinker by providing a list of 'abilities' or 'skills'. Another, and perhaps more important, reason for not explicating characteristics of critical thinkers in these terms is that doing so encourages educators to think of the task of developing critical thinking as simply a matter of teaching students a set of new and discrete skills or abilities. For reasons we explain below, we believe this is not a good way to view the task of developing critical thinking.

### *Intellectual resources necessary for critical thinking*

The best way to characterize the critical thinker is in terms of intellectual resources. As noted earlier, these intellectual resources are of five kinds: background knowledge, operational knowledge of the standards of good thinking, knowledge of key critical concepts, heuristics (strategies, procedures, etc.), and habits of mind.

#### *Background knowledge*

To a considerable extent, the quality of thinking persons are able to do about a particular problem, issue or question is determined by what they know, or are able to find out, about it and about the context in which it must be resolved. Moreover, critical thinking always takes place in the context of (and against the backdrop of) already existing concepts, beliefs, values, and ways of acting. This context plays a very significant role in determining what will count as sensible or reasonable application of standards and principles of good thinking. Thus, the depth of knowledge, understanding and experience persons have in a particular area of study or practice is a significant determinant of the degree to which they are capable of thinking critically in that area. For example, standards for assessing the strength of inductive evidence for an empirical generalization cannot be sensibly or sensitively applied without knowing something about the nature of the phenomena covered by the generalization, including background theories concerning it and related phenomena. Similarly, thinking critically in deciding whether to accept or reject a moral judgement requires a clear understanding of the nature of the action or policy being judged, the context in which it is to be carried out, and the range of moral considerations relevant to the judgement.

What is true of moral deliberation and of deliberation aimed at determining the adequacy of evidence for a scientific claim is equally true of deliberation aimed at assessing a historical account, solving a technological problem, or deciding how to arrange a piece of music. All require adequate background knowledge and experience if they are to be responsible. Although the necessity of background knowledge seems obvious, it is worth noting here because some educators who accept the distinction between teaching 'content' and teaching 'processes' view critical thinking as a process, and regard its development as being completely independent of the development of knowledge.<sup>11</sup>

*Operational knowledge of the standards of good thinking*

We have contended that fulfilling relevant standards of critical assessment in carrying out thinking tasks is at the heart of critical thinking. Thus, knowledge, at the operational level, of the standards that govern critical deliberation and judgement, is necessary for anyone who would think critically. Every area of intelligent human inquiry and practice, including science, art, law and morality, embodies within it practices of criticism by which proposed conclusions or ways of acting are tested, and previously accepted beliefs, practices and institutions are criticized and revised. Implicit in these practices are standards of critical assessment. It is these standards that critical thinkers must learn to use. They include not just rules of logic, but also standards of practical deliberation, standards of argumentation, standards used in developing plans of action, standards governing judgements made in the course of action (as in artistic and athletic performances), and standards governing inquiry and justification in specialized areas of study such as art, biology, history, literary criticism, mathematics, and technology.

It is helpful to consider such standards as comprising two kinds; (1) standards that are relevant to *judging intellectual products* (e.g. arguments, theories, legal judgements, work of art), and (2) principles that are relevant to *guiding practices of deliberation or inquiry*. There is considerable overlap between these two kinds, because principles of good deliberation must ensure responsible application of appropriate standards for judging intellectual products.<sup>12</sup>

Important kinds of standards for judging intellectual products include standards for judging the adequacy of claims about meaning; the credibility of statements made by authorities; the reliability of reports made by observers; the validity of deductive arguments; the strength of inductive arguments; and the adequacy of moral, legal and aesthetic reasons.

A variety of different kinds of problems and issues may occasion deliberation, each of which is governed by somewhat different principles. The following principles, which are relevant to a problem of deciding what to do, are illustrative of principles of deliberation. One should:

- consider as many plausible alternative courses of action as is reasonable given the context of the decision, its significance, and one's prior reasoning about similar decisions;

- attempt to discover and take into account as much relevant information about the nature and consequences of each alternative as is reasonable given the context of the decision; and
- make a reasonable attempt to acquire an awareness of the point of view and presuppositions underlying one's thinking, and the possible biases to which this may give rise.<sup>13</sup>

Analogous sorts of principles underlie every kind of deliberation, including those undertaken in carrying out investigations in various areas of science or history, in deciding the morality of a course of action, and in deciding how to stage a play or build a machine.

Just what is involved in acquiring operational knowledge of such standards and principles? Some rules, such as rules of a game or directions for filling out an income tax form, are explicitly formulated to prescribe action in a clear and unambiguous way. One who understands the statement expressing the rule knows precisely what to do—because the verbal formulation of the rule tells one everything there is to know about the rule and how to apply it. Standards of critical thinking are very different, for they are not 'made up' to do a particular job; rather they are discovered by analysis of our critical practices. Logicians' accounts of rules for assessing deductive arguments, for example, are derived from analysis of practices of argumentation and argument criticism. As Ryle (1963: 30) points out, 'rules of correct reasoning were first extracted by Aristotle, yet men knew how to avoid and detect fallacies before they learned his lessons'.

Because verbal formulations of principles of critical thinking are abstracted from good critical practice, they typically do not tell a thinker all there is to know about the principles and how to apply them. For this reason they cannot be applied in a mechanical fashion. Rather, their abstractness gives them a vagueness that makes it necessary for the critical thinker to exercise judgement in interpreting them and determining what they require in any particular case. To acquire judgement of this sort, it is necessary to understand the practices of which the critical thinking principles are a part, and the point or purpose of these practices. It is also necessary to be acquainted with exemplars of the use of good judgement in applying the principles in a variety of contexts, because such examples provide the best indication of how the principle applies to particular cases.<sup>14</sup>

Standards and principles implicit in good critical practices function in much the same way as standards of good language use. Just as one can learn to speak and write correctly without being able to state the standards of good language use, so too can one learn to think critically without being able to state the standards of critical thinking. What is crucial to thinking critically is being able to act in the way the principles prescribe and being able to recognize when one's own and others' thinking fulfil the relevant standards.

Standards and principles of critical thinking are cultural artifacts that may be, and sometimes are, criticized and altered on the basis of our collective experience in using them. As Scheffler (1966: 112–113) puts it, they are part of *evolving* traditions of inquiry and criticism. This means that

critical thinking cannot be blind or unreflective following of standards and principles of good thinking. Although such standards are not readily revised, the appropriateness of any particular standard or the force it should have in a given context may always become a matter for critical reflection.

*Knowledge of key critical concepts*

Critical thinking, we have argued, involves both appraising intellectual products, i.e. arguments, statements, definitions, etc., and carrying out responsible deliberation. Criteria and standards relevant to assessing intellectual products vary from one sort of intellectual product to another. Hence, critical thinkers need to be able to distinguish among different kinds of intellectual products if they are to appraise them properly. For example, confronted with a statement requiring evaluation, they will need to recognize whether it is a value statement, an empirical statement, or a conceptual statement if they are to make a responsible assessment of it. Some intellectual products are best evaluated after they have been analysed and reconstructed in a more perspicuous form. Thus, for example, it is desirable that the critical thinker be able to reconstruct arguments by differentiating their premises, conclusions and assumptions.

Concepts that enable the critical thinker to differentiate kinds of intellectual products or to analyse them in such a way as to make it easier to evaluate them are 'critical concepts'. A critical thinker should have a wide range of such concepts. It is important to be clear that one may have a critical concept such as *premise* or *conclusion* without being able to define these terms. Acquiring critical concepts is not essentially a matter of acquiring new terminology; rather, it is a matter of learning to make appropriate distinctions. Examples of useful critical concepts include concepts for distinguishing metaphorical and literal language; necessary and sufficient conditions; assumptions, presuppositions and implications of an argument; and aesthetic, moral and prudential judgements.

*Heuristics (strategies, procedures, etc.)*

In the course of intellectual history, human beings have discovered or devised strategies or heuristics for guiding performance in a variety of thinking tasks. For example, in appraising a definition or general principle it is often useful to approach the task by trying to think of counter-examples. To clarify what someone means by a term, it is useful to ask for examples of things to which he or she would apply the term, or to suggest what he or she thinks might be good examples and ask for confirmation of them. To decide which side of an issue to support it is sometimes useful to make a list of the reasons for and against each side. And, it is often helpful to discuss a problem or an issue with a knowledgeable person. The critical thinker requires a rich repertoire of such heuristic devices in order to deal effectively with a wide range of thinking tasks.

The most powerful heuristics tend to be those designed to guide persons in carrying out rather specific kinds of tasks. Procedures designed to apply in all cases of critical thinking, such as the 'problem-solving procedure', are likely to give little help in solving any particular problem.

As Perkins (1987: 55–56) puts it, there is a trade-off between power and generality. However, psychological research in problem solving and cognitive functioning suggests a number of simple yet useful heuristics that have fairly general utility. For example, Janis and Mann (1977: 11) recommend that persons engaged in decision making ‘re-examine the positive and negative consequences of all known alternatives, including those originally regarded as unacceptable, before making a final choice’. In a similar vein, Flavell (1976) suggests it is useful to remind ourselves to double-check something before accepting it as fact. Sternberg (1987) suggests that in problem solving, it is useful to attempt to divide a difficult problem into a series of subproblems more amenable to solution. As a general strategy for keeping alert to what one is doing, Perkins (1987: 55) suggests that students be encouraged to ask themselves every 5 or 10 minutes whether they are making progress, whether they should change directions and what their options are.

### *Habits of mind*

Having the intellectual resources necessary for critical thinking does not, by itself, make one a critical thinker. One must also have certain commitments, attitudes or habits of mind that dispose him or her to use these resources to fulfil relevant standards and principles of good thinking. Passmore (1967: 197) aptly characterizes the possession of these character traits as having a ‘critical spirit’. Moreover, as Siegel (1988: 9) points out, the critical thinker’s tendency to fulfil the standards and principles of good thinking cannot be mindless or simply the result of habituation. Rather, it must be based on a recognition of the value of critical thinking, i.e. its importance in fostering true belief and responsible action. This is a significant point for, as we noted earlier, critical thinkers must be able to reflect on the relevance and adequacy of the principles of thinking they are using in any particular case. This is possible only if their fundamental commitment is to responsible belief and action rather than to particular principles of good thinking. The attitudes and habits of mind required by critical thinkers have been characterized in a variety of ways;<sup>15</sup> some of the more important of these include:

- *respect for reasons and truth* (commitment to having justified beliefs, values and actions);
- *respect for high-quality products and performances* (appreciation of good design and effective performance);
- *an inquiring attitude* (inclination to assess the support for judgements one is asked to accept);
- *open-mindedness* (disposition to withhold judgement and seek new evidence or points of view when existing evidence is inadequate or contentious, and willingness to revise one’s view should the evidence warrant it);
- *fair-mindedness* (commitment to understanding and giving fair consideration to alternative points of view, disposition to seek evidence or reasons that may tell against one’s view);

- *independent-mindedness* (possession of the intellectual honesty and courage necessary for seeking out relevant evidence and basing one's beliefs and actions on it, despite pressures or temptations to do otherwise, and the personal strength to stand up for one's firmly grounded beliefs);
- *respect for others in group inquiry and deliberation* (commitment to open, critical discussion in which all persons are given a fair hearing and their feelings as well as their interests are taken into account);
- *respect for legitimate intellectual authority* (appreciation of the importance of giving due weight to the views of persons who satisfy the criteria for being an authority in a relevant area of study or practice)<sup>16</sup>; and
- *an intellectual work-ethic* (commitment to carrying out relevant thinking tasks in a competent manner).

### Intellectual resources and habits of mind: an illustration

The following description should help to make clearer how intellectual resources and habits of mind come into play in critical thinking. The person engaging in critical thinking in this example is attempting to decide what stance to take toward the British Columbia government's decision in 1993 to permit logging in some parts of the Clayoquot Sound area on Vancouver Island and to set aside other parts as a provincial park.<sup>17</sup>

*Context:* She has read a number of arguments for and against the government's plan that had been printed in the local newspaper. The arguments presented are roughly as follows:

Environmentalists claim that the government has sold-out to the forestry industry and unions. Some of them claim that they cannot afford to lose any more old-growth forest. They point out that forests are needed to prevent the build-up of carbon dioxide that causes global warming, that the forests are the home of many species that are increasingly endangered by reductions to their habitat, and that old-growth forests enrich the aesthetic quality of life in British Columbia. Some persons feel so strongly about the need to preserve old-growth forests that they have publicly announced that they have 'spiked' many trees in the area and plan to recruit volunteers to spike many more.

Supporters of the government plan argue that the forestry industry needs to log at least part of the Clayoquot and other old-growth forests if it is to continue to provide jobs for people, supply lumber to build houses, and to contribute to government revenues. They claim that the land set aside for the park and for limited logging will be more than enough to maintain the aesthetic beauty of the area and to preserve the animal life there. They also argue that, because the logged areas will be replanted, there will not, in the long run, be any reduction in forested land in British Columbia.

She values preserving the natural environment and feels an emotional attachment to the protection of forests and animals. Some of her friends have joined protest demonstrations against the government's decision to permit logging. None of her friends or relatives is employed by the forestry industry.

*Critical thinking response:* The following is a sample of the critical thinking a person might do in making up her mind about this issue. The attributes of a critical thinker exhibited in her response are indicated by the following: HM is 'attitude of mind', PCT is 'principle or standard of critical thinking' and S/H is 'strategy or heuristic'.

She checks her immediate impulse to rush out and join the demonstrators because she wants to be sure that there are good reasons for doing that (HM: *Open-mindedness and respect for truth*).

She considers whether the consequences of stopping to deliberate about the best thing to do would likely be worse than acting without further deliberation (PCT: *Extended deliberation is often, although not always, desirable*). She decides that there is sufficient time for more careful deliberation before acting.

She attempts to understand clearly all of the reasons there are supporting the government's decision, and all of the reasons for protesting and trying to change that decision (PCT: *The more relevant information taken into account in deciding on a course of action, the more reasonable the decision is likely to be*). In doing this she considers whether the claims of the government, the forestry industry and environmentalists about the likely consequences of the government's policy should be believed (HM: *An inquiring attitude*). She knows that all of these groups have access to experts in economics and ecology, but also that they stand to gain by misrepresenting the facts about the likely consequences (PCT: *People who will gain by deception are less reliable authorities than those with nothing to gain*). She also considers how adequate the newspaper accounts of reasons for and against the government's decision are likely to be (PCT: *Information sources should be accurate and unbiased*). She is aware also that the emotionally charged language used in the newspaper reports could influence her to hold views not supported by good reasons (PCT: *Emotive language is not a substitute for reasoned argument*).

She decides she should try to substantiate the various claims about the likely consequences of the government's policy by consulting the work of experts who are not politically involved in the decision (PCT: *Expert opinions warrant more credence if the experts have appropriate training and experience in the field of study relevant to the judgements they are making, are knowledgeable about the specific topic, and are supported in their judgements by others in their field*).

She considers whether she has any assumptions or preconceptions that would prevent her from making an unbiased assessment of reasons for this case (HM: *Fair-mindedness*). She decides her attachment to environmentalism and lack of contact with persons whose livelihood depends on logging may lead her to undervalue economic reasons for permitting logging (HM: *Open-mindedness*). Consequently, she decides to talk to forestry workers to get a more sympathetic understanding of their point of view (PCT: *Positions are better grounded if they have taken into consideration different points of view*).

She is aware that there may be other options open to her besides simply accepting the government's decision or joining protest marches. She tries to think of other plausible courses or action that would produce more desirable consequences (PCT: *In deciding what to do one should consider all plausible alternatives*). Because she is aware that others may already have thought of plausible alternative course of action she seeks out knowledgeable people to discuss with them what they think ought to be done and why (S/H: *It is generally useful to confer with knowledgeable people*). In the course of the discussions she often asks for clarification of the terms other people use,

including terms such as 'sustainable harvest' and 'biodiversity', and gives examples of what she means by various terms she uses to make them clear to others (S/H: *Check for clarity and shared meanings of terms by asking for and giving examples*).

Having identified the likely consequences of each of the courses of action that seem plausible, she considers whether any of the courses of action involves treating others unjustly or otherwise acting immorally (PCT: *In deciding what to do, the morality of each of the alternatives is a relevant consideration*). She decides to rule out the option of joining the tree-spiking expeditions, because she has good reason to believe that this course of action could cause serious injury to persons working in the lumber industry (PCT: *In judging the morality of an action, try to make an impartial judgement that should be acceptable to the other parties who may be adversely affected by the action*). Accordingly, she tries to imagine what it would be like to be a lumber-mill worker facing the choice of not working or risking serious injury (S/H: *Test the fairness of moral judgements by sensitively imagining oneself in the predicament of others*). She decides it would be morally wrong to subject them to such risk if there are other options available for adequately preserving forests.

Having ruled out those options she has good reason to regard as immoral, she considers which of the remaining courses of action would produce the best consequences overall (PCT: *In deciding what to do consider which alternative would most fully realize the things one genuinely values without producing unacceptable negative consequences*; HM: *Commitment to decide on rational grounds*).

Having made a tentative decision about which course of action is best, she decides to discuss it with others (including those who might have reached a different decision), explaining her reasoning and inviting counterarguments (PCT: *A judgement is more justified if it takes into account all relevant points of view*; S/H: *It is generally useful to confer with knowledgeable people*). She wants to be sure she has not overlooked any important considerations or failed to appreciate the significance of any of the likely consequences for other things she values (HM: *Intellectual work ethic*).

Lacking any good reasons for changing her decision, she proceeds to act on it (HM: *Commitment to act on the basis of reasoned judgement*).

### Conceptualizing the task of teaching critical thinking

The primary benefit of a good conception of critical thinking, and the critical thinker, is that of providing fairly concrete knowledge of what is to be accomplished in teaching critical thinking. By making salient significant features of critical thinking, it identifies considerations important for deciding questions about curriculum and instruction. It seems appropriate to conclude this paper by discussing some of the more important considerations made relevant by the conception we have advanced.

In our view, teaching critical thinking is largely a matter of teaching students to make appropriate use of the concepts, standards, stratagems and procedures our culture has developed for disciplining thinking and increasing its fruitfulness. Our conception highlights the fact that these concepts and standards are embedded in complex practices of critical deliberation

and discussion. Verbal formulations of critical thinking standards and principles, being abstractions from practice in a variety of different contexts, are necessarily vague with regard to what counts as fulfilling the principle in any particular context. Thus, the critical thinker must acquire good judgement in determining what critical thinking principles require in particular contexts. The primary resource for acquiring such judgement is access to examples of how each principle applies in a wide variety of contexts. Moreover, if such examples are to provide the basis for acquiring good judgement they must exemplify the use of the principle in a context that is rich enough to make clear the point or purpose to be served by following the principle, including the point of the inquiry or practice within which the critical judgement is being made.

Thus, teaching critical thinking is best conceptualized not as a matter of teaching isolated abilities and dispositions, but rather as furthering the initiation of students into complex critical practices that embody value-commitments and require the sensitive use of a variety of intellectual resources in the exercise of good judgement. Initiation of children into these practices begins long before they enter school. By the time they are in primary school they are already making and criticizing judgements and arguments of various sorts, though their arguments and criticisms may not be very good. The educator's task is to continue the student's initiation in a more discriminating and self-conscious way, such that good critical practice is encouraged and poor practice is abandoned. This involves not simply teaching students standards and concepts of which they were previously ignorant, but also getting them to appreciate the value of changing some of their previously established commitments and practices.

Although the long-range educational project is to develop competence in thinking critically in a variety of areas, the attainment of this end is necessarily a gradual process that can begin in the earliest years in school. Teaching students how to appraise evidential arguments in history or chemistry may have to await secondary school or university, but primary students can begin to learn important commitments and habits of mind, such as thinking reasons and truth are important, respecting others in discussion, being open-minded, and being willing to look at issues from others' points of view. They can learn a variety of critical concepts, such as those necessary for distinguishing between definitions and empirical statements; they can learn a number of heuristics, such as asking for examples when the meaning of a term is unclear and reminding themselves to double-check claims before accepting them as fact; and they can learn principles, such as trying to think of alternatives when deciding what is the best thing to do. As they become more mature they can expand the range of intellectual resources they are able and willing to employ and improve the judgement with which they employ them.

We have had some success in helping teachers see what is involved in teaching critical thinking by portraying it as involving three components:

- engaging students in dealing with tasks that call for reasoned judgement or assessment,

- helping them develop intellectual resources for dealing with these tasks, and
- providing an environment in which critical thinking is valued and students are encouraged and supported in their attempts to think critically and engage in critical discussion.

There has been considerable debate among educators about whether critical thinking should be taught in a course devoted specifically to it or infused into other courses. Our conception suggests several considerations relevant to this issue. It highlights the fact that principles of good thinking must be interpreted differently in different contexts. In the absence of sound empirical evidence, we cannot safely assume that learning good judgement in applying a principle or standard in one context will generalize into good judgement in applying the principle or standard in other contexts. Moreover, different kinds of thinking tasks call into play somewhat different principles and standards of good thinking.

The strength of the infusion approach lies in the fact that it can provide for learning standards and principles of good thinking and appropriate habits of mind in a number of important contexts in history, art, music, science, mathematics, technological studies and vocational studies. The limitation of this approach is that often the standard subjects in the curriculum are not conceived in such a way as to provide for learning to think critically in some of the most important contexts in which such thinking should take place. Specifically, they do not typically engage students in thinking critically about moral problems or issues, or about what Paul (1990) calls 'multilogical' problems, i.e. problems that fall outside the boundaries of particular disciplines and require for their solution knowledge of several different kinds. These latter include all of the important practical, value-decisions persons must make about such things as where to go to university, what career to pursue, what political candidate to support, whether to buy a new car, etc. In our view, it is a mistake to think that we must choose between these approaches. It may well be that we need both infusion and special courses in critical thinking. What is essential is that appropriate habits of mind and appropriate use of intellectual resources are exemplified for students, and that they are given guided practice in critical thinking in appropriately rich contexts.

### Notes

1. See Lipman's (1991), Paul's (1982) and Siegel's (1988) criticisms of Ennis, and McPeck's (1981) criticisms of conceptions such as these four.
2. Criteria for assessing the adequacy of conceptions are discussed in Coombs and Daniels (1991).
3. Thinking and doing seem to cover all of the things about which one can make up one's mind. These categories correspond roughly to Aristotle's well-known categories of theoretical and practical reasoning. Strictly speaking, persons do not make up their minds about what to believe, they come to believe or disbelieve as the result of experience.

4. Although this is worth mentioning to avoid confusion, nothing of importance hinges on being able to specify precisely when we would say a person is not thinking critically as opposed to saying that the person is doing poor critical thinking.
5. This point is argued fully in Bailin (1987).
6. 'Deliberation' usually implies somewhat lengthy cogitation in making up one's mind. As we are using the term, however, 'deliberation' refers to what persons do in making up their minds, no matter how brief or extended their reflection. On this view a person may be 'deliberating' about what moves to make next while playing a basketball game.
7. For a discussion of the importance of critical discussion to moral and political decision making, see Putnam (1987: 42–62).
8. Lipman (1991) has given considerable attention to critical thinking in the context of discussion. His approach to teaching critical thinking focusses on developing a context for discussion which he calls a 'community of inquiry'.
9. Ennis's (1967, 1980, 1985, 1987, 1991) various formulations provide a good example of this approach.
10. Scheffer (1991) notes and deplores a similar tendency to regard descriptions of 'methodologies' in an area of inquiry as denoting basic processes of learning or cognition.
11. See, for example, British Columbia Ministry of Education (1991a, b).
12. Standards for judging intellectual products are discussed in works on informal logic and argumentation, in works dealing with research methodology in the social and physical sciences, and in works dealing with the justification of moral, aesthetic, literary, historical, and legal judgements. These works may also contain some discussion of principles of deliberation, but for the most part these principles remain unarticulated. Typically, they are conveyed not by explicit formulation but by initiating persons into the relevant critical practice.
13. These are adapted from the account given in Coombs (1997).
14. Kant (1933: 171) made this point forcefully with his claim that examples are the go-cart of judgement.
15. Attitudes, habits of mind, and intellectual virtues have been described in various ways by critical thinking theorists. Paul (1990) has perhaps the most extended discussion of such attributes. Hare (1979, 1985) has extensive discussions of the centrally important attitude of open-mindedness.
16. The importance of this often overlooked habit of mind was pointed out to us by Murray Ross. An extended discussion of the role of intellectual authority in critical thinking may be found in Ross (1994).
17. Clayoquot Sound, which stretches for about 100km along the west coast of Vancouver Island in British Columbia, Canada, is the site of an old-growth temperate rain forest. The decision of the British Columbia government in 1993 concerning development in the area sparked the 'Clayoquot Summer', in which more than 800 people were arrested for interfering with logging operations (Ecotrust Canada 1997: 4). Additional information about Clayoquot Sound may be found in Kennedy (1997/1998).
18. The ideas about critical thinking set out in this paper are being used as the framework for an extensive set of published materials for use by teachers in schools. Further information can be obtained from LeRoi Daniels, The Critical Thinking Cooperative, P.O. Box 62024, #143-4255 Arbutus RPO, Vancouver, British Columbia, Canada V6J 1Z1.

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