CRITICAL THINKING AND EDUCATIONAL REFORM:

FIVE CONCEPTIONS OF CRITICAL THINKING

by

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Critical Thinking and Educational Reform: Five Conceptions of Critical Thinking

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ABSTRACT

Critical thinking is generally assumed to be an important aim of education. There is growing concern that this aim is not being adequately achieved. Prescriptions for educational reform in this area vary, ranging from adding critical thinking courses to the curriculum to totally restructuring the curriculum. This variation can be attributed to a lack of consensus regarding the concept of critical thinking. This thesis involves an attempt to provide a definition of critical thinking which will capture the main notions inherent in the various usages of the term. Such a definition is needed in order to determine whether the perceived need for educational reform is justified, and if so, the nature of such reform.

Five conceptions of critical thinking can be categorized from current literature:

1. The three dimensional conception.
2. The logical skills conception.
3. The epistemological conception.
4. The dispositional conception.
5. The rationality conception.

These conceptions are analysed and compared for the purpose of determining the root notion of critical thinking and the pedagogical implications of critical thinking for education. The method employed is primarily conceptual analysis, however, some relevant empirical research is also cited.

Conclusions of this analysis show critical thinking to be a double-barreled concept, consisting of a cognitive component which is largely subject specific and a subject neutral dispositional component. Critical thinking is primarily concerned with validating knowledge claims. Interrelationships between critical thinking, thinking in general, language, and teaching indicate that the development of critical thinking ability depends upon teaching which provides students with problem solving experience and which develops students' ability to use language, particularly reading and writing. There is empirical evidence which suggests that although this sort of pedagogy is recognized in educational theory, it is not reflected in educational practice. To the extent that this evidence is true, there is a need for educational reform. This reform need not involve radical reconstruction of the curriculum; rather, the way in which the present curriculum is taught and evaluated needs to be reformed such that educational practice more closely reflects educational theory.

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Introduction

Critical Thinking, Education, and Educational Reform

Critical thinking is an approval term. Although this notion is not new to education, recent interest in this area has amounted to the development of a critical thinking movement. Critical thinking is generally assumed to be an important part of education. Due to a growing concern that critical thinking is not presently being adequately achieved in education, it is also perceived as an important part of educational reform.

There are various reasons for valuing critical thinking. Richard Paul, a leader in the critical thinking movement, asserts that an education incorporating critical thinking aims at the goal of "a free society of free and autonomous persons".[1] Recently, a British Columbia government submission to a Royal Commission on Education called for a greater emphasis on creativity and critical thinking, in order to produce flexible adaptive workers.[2] In the prescription for educational reform outlined in The Paideia Proposal, Mortimer Adler refers to critical thinking as an indispensible basic skill of schooling, like reading, writing, and calculating.[3] Educational philosophers Paul Hirst and R. S. Peters regard critical thinking as a human excellence and as such, an aim of education.[4] The perceived value of critical thinking can be intrinsic to education or extrinsic, depending upon one's notion of education.

Many theorists believe that current educational practice is falling short of the aim of developing critical thinking ability.

Stephen Norris claims that "critical thinking ability is not widespread", stating that there is both anecdotal and "systematic" evidence to support this claim.[5] As a result of evidence gathered in "A Study of Schooling," John Goodlad concludes that the schools he studied "did not place a high premium on experiencing democratic processes, independent thinking, creativity, and learning for the sake of learning."[6] Goodlad notes that although critical thinking is a predominant part of the goals for teaching Social Studies, this is not reflected in tests in this subject, which generally emphasized recall of facts.[7] This problem is not new: similar remarks on the apparent disparity between goals and actual practice regarding critical thinking in Social Studies were made by Howard Anderson in 1942.[8]

College and University instructors also claim that the critical thinking ability of students coming into their classrooms is inadequate. British Columbia college instructors recently complained that students entering college lacked basic reading, writing, and thinking skills.[9] J. Anthony Blair suggests that there may be many teachers whose teaching is as uncritical as Jim Keegstra's teaching and similar to it.[10] The difference, suggests Blair, is that most teachers teach more palatable theories and thus avoid the attention which Keegstra drew upon himself. Blair bases his claim partially on the performance of students in his university classes.

There have been various attempts to improve the achievement of critical thinking. National and international conferences on critical

thinking and educational reform have been held annually at Somona State University since 1980. An abundance of research on critical thinking has appeared over the past decade. In California, all Grade Eight students are now tested for critical thinking skills as part of the statewide social studies testing program. Plans are in effect to make one third of the test items in reading, written expression, and mathematics critical thinking items. A course in critical thinking is now a requirement for graduation from university in California. Critical thinking is now emphasized in the goals in the revised British Columbia Social Studies Curriculum Guide. The term is not defined or even mentioned elsewhere in the curriculum guide, thus there may be a similar problem to that described by Anderson in 1942 and more recently, by Goodlad.

Indeed a major problem with critical thinking is one of definition. Conceptions of critical thinking are numerous and varied. One researcher claims to have found thirty-five different conceptions of critical thinking in educational journals.[11] Different critical thinking tests reflect these different conceptions, drawing question to the validity of the sort of systematic evidence cited by Norris. As Romanish asserts "... the current critical thinking movement is found to be a diffuse one that has progressed to the curriculum implementation stage while overlooking several basic considerations of importance."[12]

This thesis addresses a basic consideration of importance: the concept of critical thinking. Although there are, as stated above,

numerous different conceptions of critical thinking, the focus of this thesis is on five general conceptions of critical thinking. These are:

1. The three dimensional conception.
2. The logical skills conception.
3. The epistemological conception.
4. The dispositional conception.
5. The rationality conception.

There are overlaps between some of these conceptions. They are not intended to be an exhaustive list of all known conceptions or descriptions of critical thinking; rather they are the result of an attempt to categorize the main kinds of conception of critical thinking found in the current literature.

The main purpose of this essay is to analyse and compare the five conceptions of critical thinking, bearing in mind the following questions:

1. What is the main idea or root notion of each conception?
2. What are the common elements of these conceptions?
3. Are there any missing elements?
4. What is the root notion of critical thinking?
5. What is the relationship between
   a) critical thinking and education?
   b) critical thinking and educational reform?
6. What are the pedagogical implications of critical thinking and education?

The method employed in this essay is primarily conceptual analysis. Each of the first five chapters is devoted to the analysis of one conception of critical thinking. The final chapter contains references to some empirical studies which are seen to be relevant to the notion of critical thinking and educational reform. The overall emphasis of this thesis is on the conceptual relationship between critical thinking and education.

CHAPTER 1

The Three Dimensional Conception of Critical Thinking

This conception is from Robert Ennis' paper "A Concept of Critical Thinking" (1962),[1] regarded as a landmark paper in the critical thinking movement. Ennis attempts to provide a much needed conceptual analysis of critical thinking, a field that had previously been dominated by psychological research.

1.1 The Root Notion

For Ennis, the root notion of critical thinking is "the correct assessing of statements"[2]. In a footnote, Ennis acknowledges that this is based on B. Othanel Smith's notion of critical thinking as finding out the meaning of a statement and then determining whether to reject or accept the statement.[3] Ennis provides no argument in support of this notion. He notes that while B. Othanel Smith's notion allows for 'good' and 'poor' critical thinking, "... the predominant manner of speaking presumably builds the notion of correct thinking into the notion of critical thinking."[4]

This notion of correct thinking being built into critical thinking is unclear. On one reading, Ennis appears to be implying that critical thinking exists only in a successful achievement sense. Yet, surely it is possible for a student to attempt to think critically about a statement and yet fail to achieve the correct assessment of that statement. It must also be possible that another student would achieve the correct assessment of the particular statement by luck,

without doing any critical thinking. It seems absurd to say that the first student was not thinking critically and the second student was thinking critically.

Perhaps by "correct assessing" Ennis means "correct procedure for assessing". In this sense, the first student described above could be said to be thinking critically, while the second student could not. Ennis' comment on "the predominant manner of speaking" offers a clue. When we say that a person is thinking critically, we generally understand that to mean that the person is not thinking carelessly, or sloppily. In this sense perhaps the notion of critical thinking includes the notion of correct thinking, however, much more argument would be needed to support and clarify this idea. Ennis' lack of support of the root notion of critical thinking as the correct assessing of statements amounts to a major flaw in this conception.

The restriction of critical thinking to assessing statements is also problematic. This appears to rule out the possibility of thinking critically about actions. Surely a chess player, pondering the strategies of alternatives moves is engaged in critical thinking. Critical thinking clearly involves assessment, but such assessment may be directed at actions, strategies, or procedures as well as statements. Again, no argument is offered for limiting critical thinking to statements.

1.2 The Twelve Aspects

Ennis analyses critical thinking into twelve aspects or "ways of avoiding pitfalls". These aspects were selected from literature on goals of schools and criteria for good thinking. Ennis admits that the selection was made on the basis of applicability to the root notion of critical thinking as correct assessing of statements. The twelve aspects are:[5]

1. Grasping the meaning of a statement.
2. Judging whether there is ambiguity in a line of reasoning.
3. Judging whether certain statements contradict each other.
4. Judging whether a conclusion follows necessarily.
5. Judging whether a statement is specific enough.
6. Judging whether a statement is actually the application of a certain principle.
7. Judging whether an observation statement is reliable.
8. Judging whether an inductive conclusion is warranted.
9. Judging whether the problem has been identified.
10. Judging whether something is an assumption.
11. Judging whether a definition is adequate.
12. Judging whether a statement made by an alleged authority is acceptable.

The most obvious problem with this list of aspects is that it is based on the shaky foundation of Ennis' unsupported root notion. Furthermore, as McPeck argues, any such list of pitfalls is subject to the following two problems. First, such a list could be infinite. Second, even if construed as a list of helpful hints, such a list does not provide a conceptual characterization.[6]

1.3 The Three Dimensions

As well as the twelve aspects, Ennis analyses critical thinking

into three dimensions: the logical dimension, the criterial dimension, and the pragmatic dimension.

The logical dimension centres on judging the alleged relationships between the meanings of words and statements. This includes the understanding of such logical operators as "all", "some", "if ... then" etc. According to Ennis, this dimension also includes knowing "... the meaning of basic terms in the field in which the statement under consideration is made."[8] Knowing the meanings of terms involves two levels; bare understanding (a presupposition of critical thinking) and "... knowing the implications of a statement"[9]. The logical dimension, as the name implies, is purportedly about <u>relationships between</u> meanings of words and statements, however the understanding of such relationships presupposes understanding the meanings of the particular words and statements, to the extent of knowing what is implied by a statement. Thus the logical dimension extends beyond logic, to include in-depth knowledge of the particular field or subject in question. Indeed it may be the case, though empirical validation is required here, that a student who is lacking in "critical thinking ability", may well be lacking more in the depth of field specific knowledge than in the actual "logical operators". This seems possible because some knowledge of logical operators is acquired as one learns general language use, whereas specific, in-depth knowledge of a particular field is not something that everybody may be exposed to, obviously depending upon the field in question, the depth of knowledge required by the particular problem and so on.

The criterial dimension includes knowledge of criteria (other than logical criteria) for judging statements. Ennis lists such criteria separately under each aspect. He includes a cautionary note that such criteria are not to be applied mechanically but with discretion. This, says, Ennis, is because there are numerous exceptions and qualifications not mentioned in his paper, and because ultimately, such a list "could be endless."[10] Many of these criteria have been borrowed from recognized fields. For example, aspect #7, judging the reliability of observations, uses criteria from science, law, and history.[11] Aspect #8, judging inductive conclusions, uses criteria from the field of statistics. Ennis admits "... there is a vast literature on judging the adequacy of samples.."[12] Thus, the criterial dimension seems to require a superficial introduction to the criteria of various fields. Given this, Ennis is wise to warn the budding critical thinker about mechanical application of criteria. A complex problem would possibly require the application of more specific criteria than that provided by Ennis, or knowledge of some of those exceptions and qualifications not mentioned in Ennis' paper. Knowledge of such criteria, exceptions, and qualifications would require knowledge of the specific field(s) in question.

Ennis admits that "complete criteria cannot be established for critical thinking".[13] This necessitates the pragmatic dimension. This dimension involves deciding, on the basis of the background purpose or context of the problem, when one has enough evidence. "Intelligent judgement" is called for.[13] Generally, explains Ennis, a

problem of more serious or severe impact requires more evidence than a problem of less serious or severe impact. Ennis cites an example of a matter of educational policy change requiring more evidence than a matter of altering a bus schedule by a few minutes.[14] The key words are "background purpose" and "intelligent judgement". In order to make an intelligent judgement about educational policies or bus schedules, one must know something about the educational policies or bus schedules in question.

1.4 Value Statements

Ennis specifically excludes from his concept of critical thinking the judging of value statements. He admits that the result is a "truncated" concept.[15] Ennis' stated reasons for this exclusion reveal a serious problem. Value statements are excluded: a) to make "the concept more manageable"[16] and b) because "the area of judging value statements is unwieldy in the prediction and control of students' behaviour."[17] One of Ennis' stated objectives in providing a conceptual analysis of critical thinking is to provide a basis for research in the testing of critical thinking.[18] This matter of altering the concept to fit the test, is, as McPeck argues, "like shaving a round peg to fit a square hole", and seems more like an engineering decision than a philosophical decision.[19]

Indeed, as McPeck argues, the pragmatic dimension involves making value judgments.[20] Determining when one has enough evidence involves balancing the existing evidence against the consequence of

being wrong. Doing so requires making a value judgement. It is thus inconsistent to exclude values from the analysis of critical thinking when values are essential to critical thinking.

1.5 Summary and Conclusions

Ennis' concept of critical thinking is indeed a truncated concept. His root notion of the correct assessing of statements is limited, vague, and unsupported by argument. One wonders whether the limiting of critical thinking to statements was not also an "engineering" decision, to make the concept more "testable".

Ennis' major contribution is his recognition that critical thinking includes a criterial and a pragmatic dimension, and is not merely a set of logical skills. A major shortcoming, aside from the "truncation" discussed above, is Ennis' failure to recognize fully the implications of his three dimensional analysis: each dimension presupposes knowledge of particular fields or subjects being critically thought about.

The logical dimension is predominant. All twelve aspects feature this dimension. Three aspects feature logic only, and two aspects feature logic primarily. Ennis' concept of critical thinking is perhaps best seen as a partnership between logic and knowledge of various fields, with the latter being a "silent" partner.

Ennis concludes with a short section on instruction which consists primarily of questions. These questions are paraphrased below.

1. At what ages can students master the three dimensions of critical thinking?

2. Should critical thinking be integrated into existing courses or taught separately?

3. What teaching methods are most appropriate?

4. How can teachers best be prepared to teach students to think critically?

Questions 1 and 2 are addressed in the next two chapters. Proponents of the logical skills conception of critical thinking advocate the teaching of critical thinking as a subject in its own right. On the other hand, according to McPeck's epistemological conception, critical thinking can only be achieved as part of some other subject. Ennis' final two questions are addressed in chapter 6.

Ennis has since broadened his conception of critical thinking to include more than the correct assessing of statements; however, he has come to use "critical thinking" and "rational thinking" interchangeably. Harvey Siegel also asserts that critical thinking and rational thinking are roughly equivalent: this notion is addressed in Chapter 5.

CHAPTER 2

The Logical Skills Conception of Critical Thinking

Critical thinking, as it is taught as a college or university course, generally consists of one or a combination of the following: formal logic, and informal logic. Formal logic involves deductive and inductive logic as taught in traditional logic courses, while informal logic involves analysing arguments for possible fallacies. In this chapter, these two approaches will be analysed separately, through the analysis of two texts which have been used in Philosophy 001, "Critical Thinking", at Simon Fraser University.

2.1 Formal Logic

The text Critical Thinking: Evaluating Claims and Arguments in Everyday Life[1] by Brooke Noel Moore and Richard Parker approaches the teaching of critical thinking through both formal and informal logic. For the purposes of this chapter, I will concentrate on Moore and Parker's notion of critical thinking and the relationship between that notion and formal logic. Informal logic is addressed in the second part of the chapter.

2.11 The Root Notion

The title of Moore and Parker's book emphasizes "claims and arguments in everyday life." In this way courses and texts in critical thinking differ from traditional introductory courses in logic. The aim of the critical thinking course and text is to apply

the rules of logic to arguments which occur in natural language, in newspaper editorials, advertisements and conversations.

In their preface, Moore and Parker offer a broad definition of critical thinking.[2]

> Critical thinking includes a wide variety of deliberative processes, all of them aimed at a common goal: making wise decisions about what to believe and do. Critical thinking is more than just the evaluation of arguments that happen to come our way; it includes both the inclination and the ability to search out considerations that are relevant to an issue.

The words "believe and do" suggest that this notion of critical thinking applies to actions as well as to statements. The word "inclination" suggests a dispositional component to the notion. A course based on this sort of notion would indeed have much of educational value in it. However, Moore and Parker offer a second definition in Chapter One. This definition is much narrower and is truncated like Ennis' root notion. Indeed there is a reference to B. Othanel Smith's notion of critical thinking on the title page of the chapter. Moore and Parker now define critical thinking as[3]

> ... the careful and deliberate determination of whether to accept, reject, or suspend judgement about a claim.

Perhaps this definition is the result of another "engineering" decision. This narrower conception of critical thinking is certainly easier to present in a "How to..." textbook format than would be the broad conception offered in the preface.

2.12 Formal Logic and Critical Thinking

Moore and Parker appear to be unclear about the relationship of logic to critical thinking. In the preface they state:[4]

> We confess to having long been baffled by the difficulty of applying the principles of logic to letters to the editors, family discussions, articles in opinion magazines and the like.

But, in Chapter One, the authors say "... critical thinking includes traditional logic but is somewhat broader in scope."[5] Moore and Parker explain that while traditional logic concentrates on whether the reasons, if true, support the claims of an argument, critical thinking is concerned as well with assessing the truth of the reasons.[6] Moore and Parker's approach to teaching critical thinking involves[7]

> integrating logic both formal and informal with a variety of skills and topics relevant to the task of making sound decisions about beliefs and actions and making the whole palatable by presenting it in an unfussy way in the context of real life situations.

Thus, in a way that Moore and Parker fail to make clear, formal logic is seen to have a central role in critical thinking as applied to real-life situations.

The logic component of the text consists of chapters on inductive and deductive arguments. As McPeck argues, there are problems with this approach.[8] First, this approach presupposes the ability to differentiate between conceptual questions, which require deductive analysis, and empirical questions, which require inductive analysis. This task often requires knowledge of the particular field in question. Furthermore, even within established fields, experts do not

always agree about this distinction with regard to particular propositions. Second, too much stress can be placed on this distinction alone. Arguments of the same logical type may have great differences in terms of cognitive requirements for understanding them, while some arguments of logically different types may have relatively similar cognitive requirements. McPeck uses the following four sentences as an example.[9]

1. Organisms respond to stimuli.
2. Which particular stimuli will organism X respond to?
3. Could improved spectographic methods ever measure the core temperature of a star?
4. Can you see any stars tonight?

The first statement is a conceptual truth, while the others are empirical questions. McPeck argues that the difference in cognitive requirements for understanding the first two sentences is far less than that of the second two sentences, even though the first two are of logically different types and the second two are logically similar. Thus the inductive-deductive approach is neither as simple, nor as subject neutral as it might initially appear to be.

Perhaps the most serious criticism of the notion of formal logic as a component of critical thinking is the transfer of training argument. Moore and Parker seem to be assuming that in spite of their own misgivings expressed in the preface, formal logic skills will have some application outside of the realm of formal logic, specifically in "real life" arguments. Historically, similar attempts have been made

to justify teaching science and the classics to students. Learning these subjects was thought to train the mind in some general sense. The assumption was that a mind disciplined by science or the classics would show similar discipline in other subjects as well as in day to day living. When empirical research failed to verify such transfer of thinking, the notion fell out of favour. Indeed, as Barrow argues, the notion of transfer of training was not discredited by empirical research; it was logically absurd from the start.[10] Barrow asserts "It doesn't matter how disciplined your mind is, you cannot switch to another subject and talk intelligently about it unless you have some competence within that subject."[10] Similarly, it is logically absurd to expect a mind disciplined by formal logic to show similar discipline in other subjects or in day to day living.

Proponents of logic might argue that logic is a special case of transfer of training because logic is concerned with reason. Harvey Siegel argues that pvq-p amounts to a conclusive reason for accepting q, therefore logic is an important sub-component of critical thinking.[12] There are two problems with this. First, arguments found outside of formal logic courses are not always easily translated into such forms. Second, and more important, as Moore and Parker have stated, the critical thinker is concerned with assessing the truth of premises, as well as with the form of the argument. Thus if the truth of p in the above example is in doubt, the critical thinker may have good reason for not accepting q. Indeed, in "real life" issues such as abortion, acid rain, free trade etc., it is the veracity of p as

presented in the conflicting views of various "experts" that will often confound the would-be critical thinker, not the form of the argument in which p occurs. Assessing the veracity of p requires knowledge of the subject matter in question. Moore and Parker are clearly aware of this, for in spite of their insistence that critical thinking is "an academic area",[13] that critical thinking is a "skill",[14] which, like tennis, requires practice, and that logic is an important component of critical thinking, they make the following important admission[15]

> The single most effective means of increasing your ability as critical thinker, regardless of the subject, is to increase what you know: read widely, converse freely, and develop an enquiring attitude! There is simply no substitute for broad general knowledge.

If this piece of advice is accurate and true, then one cannot help but question the usefulness or soundness of a book or course entitled "Critical Thinking". The business of acquiring a broad general knowledge and developing an enquiring attitude involves nothing short of becoming educated. This is, needless to say, far more than can be attained in one text or one course. Moore and Parker offer a superficial introduction to various forms of knowledge, including chapters on causal arguments which draw from science and social sciences, and a chapter on moral reasoning. This sort of superficial general studies approach is subject to the same criticisms as Ennis' criterial dimension. It is a poor substitute for a genuine broad knowledge.

2.13 Summary and Conclusions: Formal Logic and Critical Thinking

Moore and Parker's conception of critical thinking is similar to Ennis' conception in certain respects. Critical thinking is restricted to assessing statements. Though presented as a separate discipline, critical thinking requires at the very least a superficial introduction to various fields of knowledge. The notion of the "silent partnership" is again applicable.

Moore and Parker, in spite of concentrating on real life arguments, offer a severely truncated conception of critical thinking in comparison with the sort of critical thinking that would be achieved by an educated person. Such a person would have no need for Moore and Parkers' book.

The value of formal logic to critical thinking in other subject areas is highly questionable, primarily due to the transfer of training problem. The informal logic movement attempts to address this problem.

2.2 Informal Logic

Proponents of informal logic see formal logic as being inapplicable to everyday arguments in natural language. Richard Paul argues that the Informal Logic Movement[16]

> ought to move to become a professional group that superintends the teaching of logic-critical thinking skills in the public schools and so universalize its influence in education.

R. H. Johnson and J. A. Blair, leaders in this movement, are the authors of Logical Self-Defense[17], an informal logic text to be used

in critical thinking courses. Johnson and Blair make it clear in their introduction that for them critical thinking and informal logic are virtually synonymous.[18]

2.21 The Root Notion

As the title of their text implies, Johnson and Blair present a consumer education conception of critical thinking.[19]

> ... you are a consumer of beliefs and values no less than of products. That raises the question: how good are your buying habits?

2.211 The Concept of Fallacy

The concept of fallacy is central to this consumer approach. Johnson and Blair define fallacy as "... a violation of one of the criteria which govern good arguments."[20] There are three such criteria.[21]

1. Premises must be relevant to the conclusion.
2. Premises must be sufficient to support the conclusion.
3. Premises must be acceptable.

The text deals with nineteen common fallacies. There are three basic or "genus" fallacies under which the remaining sixteen can be categorized. These three basic fallacies relate respectively to the above listed criteria for good arguments[22]

1. Irrelevant reason.
2. Hasty conclusion.
3. Problematic premise.

The fallacies and criteria are presented in order of importance. Irrelevant reason is considered to be a serious flaw. Hasty conclusion merely points out missing evidence and is serious only if such evidence is unavailable to "repair" the argument. Problematic premise is considered to be the least serious, and usually just specifies a need for more information. Again, this could be serious if such information is unavailable.

Each fallacy in the text is presented in a similar manner. The fallacy is defined in terms of criteria, and examples follow. Groups of fallacies are presented in each chapter, with exercises at the end of the chapter. The authors emphasize that it is not sufficient to merely label a fallacy. The student must understand "... what is wrong with each fallacious move and ... argue soundly that it is mistaken."[23]

2.22 Irrelevant Reason

Because irrelevant reason is the most serious of fallacies, and because the concept of fallacy is central to Johnson and Blair's notion of critical thinking, a discussion of this fallacy follows.

The conditions for this fallacy are:[24]

1. M has put forth QRS as premises for T.
2. In conjunction with RS ... Q is irrelevant to T.

The examples used in the text is taken from a response by Health Minister Marc Lalonde to a charge that the Federal Department of Health and Welfare had cooperated with the Kellogg Company in allowing

that company to sell a cereal, Kellogg's Corn Flakes, which had "no nutritional value."[25]

> As for the nutritional value of corn flakes, the milk you have with your corn flakes has great nutritional value.

The authors "reconstruct" Lalonde's argument, identifying the premise and conclusion in order to satisfy condition #1.[26]

1. The milk one has with Kellogg's Corn Flakes has great nutritional value.

    a) Kellogg's Corn Flakes have significant nutritional value.

The authors then show an example of how to satisfy condition #2 by arguing why the premise is irrelevant.[27]

> The nutrient properties of milk have no bearing on the nutrient properties of Corn Flakes, even if the two usually are consumed together. To determine the nutrient values of any food, one needs to measure the values of the foot itself (protein, carbohydrates, fat) not those of its companions.

Johnson and Blair refer to the task of showing, through argument, that a premise is irrelevant as a "thorny problem" saying "the difficulty of the task cannot be minimalized."[28] The authors also state "relevance is always a judgement call"[29]. Johnson and Blair seem unwilling to admit that relevance cannot be generalized. It is subject specific. In the Corn Flakes example, one who had no elementary nutritional knowledge could not have produced the sort of argument Johnson and Blair identify as necessary to establish irrelevance. The authors seem to assume that such knowledge is common knowledge, which it hopefully is for their audience. Given a more complex "everyday" issue such as free trade the critical thinker might

require some knowledge of economics in order to adequately argue the irrelevance of a premise.

In the examples of fallacies given in this text, arguments are taken from recent news issues or from simple content like the corn flakes example. Such material is part of the "common knowledge" of most college and university students. Thus an impression is created that critical thinking is a set of generic skills when in fact specific knowledge is needed.

2.23 Hasty Conclusion and Problematic Premise

The less important fallacies of "hasty conclusion" and "problematic premise" also depend on subject knowledge. The conditions of "hasty conclusion" require the determining of sufficience of evidence. Sufficience of evidence depends on the particular context, as pointed out by Ennis in his pragmatic dimension. As was argued in chapter 1, the pragmatic dimension requires subject specific knowledge.

In the case of attempting to show that a premise is problematic, Johnson and Blair assert[30]

> ... for any particular argument, unless you can give a specific reason relating to that subject matter and that argument, your charge will amount to no more than a general accusation which is problematic in itself. (my emphasis)

Once again subject specific knowledge is required.

2.24 Faulty Analogy

As a final example, a "species" of irrelevant reason, "faulty analogy" will be analyzed. This example is intended to show that in a

context which goes beyond the sort of "common knowledge" examples cited in Logical Self Defense, the knowledge of a particular fallacy is neither necessary nor sufficient for critical thinking. My example is taken from a controversy between John McPeck and Harvey Siegel. The controversy centres on the nature of thinking and whether it can be considered to be a general or a subject specific activity.

John McPeck asserts "thinking is always thinking about something."[31] He argues as follows:[32]

> In isolation from a particular subject the phrase "critical thinking" neither refers to nor denotes any particular skill. It follows from this that it makes no sense to talk about critical thinking as a distinct subject and that it therefore cannot profitably be taught as such.

Harvey Siegel responds to this argument using an analogy.[33]

> It is not the case that the general activity of thinking "is logically connected to an X" any more than the general activity of cycling is logically connected to any particular bicycle.... As we can teach cycling, so critical thinking might be taught.

Johnson and Blair state the conditions of faulty analogy as follows:[34]

1. An analogy is offered in support of the conclusion of an argument.
2. The two things are not similar in the respect required to support the conclusion.

As with the other fallacies, the mere labelling of this fallacy is insufficient; one must argue that the two things being compared are not the same.

McPeck responds to Siegel's charge without referring to "faulty analogy" as a fallacy.[35]

> It seems to me that this analogy with cycling falls wide of its mark for one crucial reason: "cycling" does denote a specific skill, whereas "thinking" does not. All manner of things can and do count as effective thinking, but not all manner of things can count as cycling...

McPeck's argument that thinking is not like cycling in terms of being a teachable general skill depends on knowledge of cycling and of the concept of thinking. The student who has mastered Johnson and Blair's faulty analogy exercises, but who knows little about the concept of thinking (i.e. that it is polymorphous) would fail to argue that Siegel had committed the fallacy of faulty analogy. On the other hand, a student who had never heard of this particular fallacy, but who had adequate knowledge of cycling and thinking, would likely argue that there are weaknesses in Siegel's argument. Thus, knowledge of this fallacy, as presented by Johnson and Blair, is neither necessary nor sufficient to critical thinking.

2.25 Summary and Conclusions: Informal Logic

For each fallacy, Johnson and Blair stress the importance of arguing why a particular fallacy has been committed. In each case outlined above, such argument has been shown to depend on background knowledge. The mere naming of the fallacy is of little importance, as Johnson and Blair readily admit. Thus knowledge is again the silent and important partner in this conception of critical thinking.

2.3 Summary and Conclusions: Logical Skills Conception

Logical skills are a necessary, though not sufficient condition for critical thinking. The use of both formal logic and informal logic in critical thinking depend upon presupposed subject specific knowledge. Both approaches tend to emphasize the critical thinker in the role of consumer of ideas. In this way and in the narrow focus on everyday arguments, this concept of critical thinking falls short of the sort of ideal aimed at by critical thinking as a means of educational reform. If critical thinking has value in education and educational reform it must apply to the critical thinker's own production of ideas as well as his consumption of the ideas of others, and it must involve more than the ability to analyse flaws in arguments in newspapers.

The limitations of the skills notion of critical thinking are exposed by Passmore's discussion of Max Black's Critical Thinking.[36] We can substitute Johnson and Blair's or Moore and Parkers' texts in place of Black's in the argument.

Passmore asks his reader to imagine a student who reads the text on critical thinking, masters the exercises, believes everything the author says, but does not apply any of the skills. Passmore argues that such a person cannot be said to have learned to be critical, any more than one who has merely mastered a driving manual but never attempted to apply the skills can be said to have learned to drive.

Another problem with the skills notion of critical thinking is the possibility that skills can be misused by "sham" critical thinkers or

"sophists", who might conceivably use fallacies to hide flaws in their own arguments.[37]

Thus, the dispositional component alluded to by Moore and Parker in their preface must be addressed. This is recognized by McPeck who addresses further the relationship between knowledge and critical thinking in his epistemological conception of critical thinking.

CHAPTER 3

The Epistemological Conception of Critical Thinking

McPeck begins his analysis of critical thinking with the assertion "Thinking is always about something, some X."[1] To think about nothing is a conceptual impossibility. The adjective "critical" describes how we think; it does not describe what we think about. Therefore critical thinking, like thinking in general, must be applied to a specific subject, X.

3.1 The Root Notion: "Informal"

McPeck defines critical thinking "informally" as ..."the propensity and skill to engage in an activity with reflective scepticism."[2] McPeck explains that "reflective" indicates a quality or level of deliberation such that the critical thinker appears capable of offering a plausible alternative. In most problem solving situations, generating a hypothesis is the hardest work states McPeck. This shows the limitation of logic; logic alone cannot generate an hypothesis.[3]

It is questionable whether the generation of hypotheses falls within the realm of critical thinking. It seems that generation of an hypothesis might be a creative process while assessment of the hypothesis might be a critical process. Indeed, as Perkins states, critical thinking and creative thinking are not easily separated.[4]

> From a philosophical standpoint the two can't be clearly separated. The creative thinker has to be critically aware because creative thinking except in the simplest situations

> involves the generation and sifting of possibilities and reworking them. That has to be a critical process.

This suggests that not only is critical thinking impossible to separate from a subject X, as McPeck argues, but it is also difficult to separate from other kinds of thinking such as creative thinking. The relationship between critical and creative thinking is also addressed in Passmore's dispositional conception of critical thinking, which is discussed in the next chapter.

McPeck states that the word reflective also implies a judicious use of scepticism, tempered by experience. The criterion for this judicious scepticism comes from the particular subject area in question. But, as Siegel argues, there is a problem of circularity here.[5] The appropriateness of scepticism is to be determined by criteria gathered from the particular subject, according to McPeck. Yet selection of those very criteria require application of critical thinking. Thus justified reflective scepticism assumes critical thinking.

3.2 The Root Notion: "Formal"

McPeck offers a "formal" definition of critical thinking as follows:

> Let X stand for any problem or activity requiring some mental effort.
> Let E stand for the available evidence from the pertinent field or problem area.
> Let P stand for some proposition or action within X.
>
> Then we can say of a given student (S) that he is a critical thinker in area X if S has the disposition and skill to do X

in such a way that E or some subset of E is suspended as being sufficient to establish the truth or viability of P.

McPeck's definition does not build in success; critical thinking can be both a task and an achievement. In this definition, critical thinking is not limited to assessing statements; methods, strategies, techniques, and activities can also be the subject or object of critical thinking. McPeck also recognizes that critical thinking ability is not sufficient; one must have a propensity or disposition to think critically; however, McPeck offers little elaboration on the nature of this disposition.

3.3 Epistemological Approach

McPeck argues, since critical thinking is always about X, it is intimately connected with various fields of knowledge. A necessary condition for education is to understand the nature of good reasons for various beliefs. A minimal condition for understanding good reasons is to understand the specialized or technical language of the particular field. Thus, argues McPeck, semantic content is more important than syntactic (logical) content.[7] McPeck's argument shows that the important aspects of Ennis' logical dimension, understanding the meaning of basic terms in the field and knowing the implications of a statement are not logical, but conceptual in nature.

Harvey Siegel is critical of this position. He argues that not all reasons are expressed in specialized and technical language;[8] however, it is not clear whether he is referring to reasons in "everyday" situations or in educational situations. We might

reasonably expect education to involve the introduction of specialized technical languages of the disciplines or fields of knowledge. Thus Siegel's point appears valid only if one accepts the truncated consumer education approach to critical thinking outlined in the previous chapter.

3.4 Critical Thinking and Education

McPeck argues that critical thinking is a necessary condition of education.[9] Education involves the acquisition of knowledge. Knowledge, as opposed to opinion, involves the justification of belief. The justification process has two dimensions. First, one has to assess the veracity of the evidence. Second, one must judge whether the new belief together with its supporting evidence is compatible with one's existing belief system. If the new belief, together with its supporting evidence is not compatible with the existing belief system, some adjustment may be required, either to the new belief, or to the existing belief system. This is a process of taking ownership of knowledge as opposed to the mere rote acquisition of facts. Justification involves a temporary suspension of belief, thus critical thinking is a necessary condition of acquiring knowledge and therefore is a necessary condition of education.

3.5 Summary and Conclusions

McPeck brings knowledge, the silent partner of the previous conceptions, out into the open. He establishes some important

connections between critical thinking, knowledge, and education. According to this conception, critical thinking makes the important difference between rote memorization and true acquisition of knowledge.

A major problem with McPeck's analysis is the lack of detail with regard to the dispositional aspect of critical thinking. McPeck argues that critical thinking is a necessary condition of knowledge, and that knowledge is a necessary condition of critical thinking.[10] The apparent circularity of this argument might be explained by viewing the relationship between critical thinking and knowledge as a spiral, rather than a circle. In this way, knowledge and critical thinking can be seen in a mutual relationship where each increases by degree such that a minimal acquisition of knowledge permits a minimal level of critical thinking ability which in turn permits greater acquisition of knowledge and so on.

McPeck recommends that critical thinking begin only at the secondary level of schooling as elementary schools are already busy enough with the basic skills.[11] Is McPeck therefore assuming that a precondition of knowledge and critical thinking is several years of mere inculcation of facts and skills? Clearly the bottom of the spiral must be based on the inculcation of some very basic facts and skills, but to suggest that this foundation is made of the entire seven years of elementary schooling seems to ignore the importance of the development of the critical disposition. Can we reasonably expect a student to accept unquestioningly everything presented to him in

elementary school and then to suddenly acquire a critical disposition in secondary school?

The major weakness of McPeck's conception is his lack of elaboration on the nature of the critical thinking disposition. He rules out Passmore's notion of a critical disposition as a character trait on the grounds that character trait "connotes something more or less immutable in one's personality."[12] Perhaps it is this assumption that schools can have no influence over the development of certain traits that is at the root of the alleged problem of students who lack critical thinking ability. Three dispositional conceptions of critical thinking are analysed in the next chapter.

CHAPTER 4

The Dispositional Conceptions of Critical Thinking

Three related conceptions of critical thinking are analysed here. Each stresses the development of certain character traits. Hare's concept of open-mindedness concentrates solely on the development of a particular disposition. John Passmore's notion of critical thinking, like McPeck's, links critical thinking with learning formal disciplines, however Passmore stresses the notion of being critical as a character trait. Richard Paul's strong sense of critical thinking emphasizes the development of specific character traits along with the development of informal logic skills.

4.1 Open-mindedness

Open-mindedness is not intended by Hare to be considered as a conception of critical thinking, however there are notable conceptual overlaps between open-mindedness and critical thinking, as observed by Soltis:[1]

> I think teaching people the attitude of open-mindedness will do more to foster critical thinking than any of the more direct approaches.

4.11 The Root Notion of Open-mindedness

> A person who is open-minded is disposed to revise or reject the position he holds if sound objections are brought against it, or, in the situation in which the person presently has no opinion on some issue, he is disposed to make up his mind in the light of available evidence and argument as objectively and impartially as possible.[2]

Open-mindedness thus describes a person's thinking. Success is not built into the definition; a person may have an open-minded

attitude towards his position and still fail to find any objections to it. The attitude of open-mindedness may be applied to a single subject or to a broad range of subjects.

The term is necessarily broad in its range of application. We cannot say exactly when a person will display open-mindedness by revising his views any more than we can say when a person with a sense of humour will laugh, explains Hare.[3] This is because of the nature of character traits. A trait describes[4]

> the sorts of ways (not precise mandatory ways but an open ended range of ways) in which people frequently (but not always and necessarily) behave in certain sorts (not precisely specified) of circumstances.

4.12 Open-mindedness and Education

Hare argues that according to Peters' concept of education, the educated person is trying to differentiate between the true and the false and cares about this difference.[5] Open-mindedness is a necessary condition of having concern for the truth and is therefore a necessary condition of education.

Open-mindedness, asserts Hare, is an appropriate attitude to knowledge claims in that possession of this attitude involves the recognition that knowledge claims are revisable in light of counter evidence or counter argument.[6] There is no logical reason, according to Hare, why such an attitude could not be transferable across subjects. There may, however, be reasons which prevent this, such as religious indoctrination.

Open-mindedness is seen as being a necessary but not a sufficient condition of education. One must know X before being open-minded

about X.[7] Note again, the apparent circularity, as with McPeck's argument. As is the case with critical thinking, open-mindedness is a necessary condition for assessing the truth of knowledge claims. At the same time knowledge is a necessary condition for open-mindedness. Because open-mindedness is a necessary condition of caring about the truth, it is also a necessary condition of critical thinking.

4.13 Summary and Conclusions: Open-mindedness

Open-mindedness seems to fill in the dispositional gap in McPeck's epistemological conception of critical thinking. It is a necessary, but not sufficient condition of critical thinking. Open-mindedness involves the disposition to revise or reject one's position if sound objections are raised. The soundness of those objections must be assessed, which involves the subject specific skill aspect of McPeck's conception of critical thinking.

Thus critical thinking appears to have a double-barreled nature consisting of a cognitive aspect which is largely subject specific, and a dispositional aspect which is subject neutral. Passmore's critical spirit conception reflects this double-barreled nature of critical thinking.

4.2 The Critical Spirit

According to Passmore, learning to be critical is not merely a matter of acquiring certain habits or skills. When we describe a

person as critical, asserts Passmore, we say something about that person's nature.

4.21 The Root Notion

Passmore differentiates between critical skills and the critical spirit. Teachers and coaches employ critical skills in assessing their students' performances in terms of certain standards or norms. The critical spirit involves more than critical skills; one who possesses the critical spirit is prepared to call into question those standards or norms by which performance is assessed and to question the value of the performance itself, as opposed to the level of achievement of that performance. The skills of the critical thinker, like the skills of a judge, can be used or misused. The critical spirit, like the principle of justice, cannot be used or misused. The educator is thus concerned with engendering the critical spirit in his students.

4.22 Critical Thinking and Education

Passmore views critical thought as a necessary, but not sufficient, condition of education.[9] The educated man must be independent, and critical, but he must also be initiated into the disciplines or great traditions. Critical thinking is not a subject, but may be pursued as part of any subject or discipline. As is the case with Hare's notion of open-mindedness, it is logically possible

that the critical attitude may transfer across subjects, but this remains to be empirically proven.

Passmore uses the term "critico creative thought" because the word critical alone may suggest the mere thinking up of objections.[10] Critico creative thought in the great traditions (disciplines) amounts to... "a single form of thinking where imagination is controlled by criticisms and criticisms are transformed to new ways of looking at things."[11] This is similar to Perkins' observation that critical and creative thinking are difficult to separate.

Passmore sees the teacher's main job as helping the child to acquire a skill.[12] By "skill", Passmore means ability to criticise or apply rules in situations which are not wholly predictable in advance. For example, Passmore differentiates between the student who has been drilled to translate "merci" to "thank you" and the skilled translator who may use "thanks" or "ta" instead of "thank you" depending on the context or situation. The student has been drilled to react automatically without thinking, to the "sensation" of hearing "merci"; the skilled translator has been taught to react with thought and care. Thus the concern once again is with true acquisition and application of knowledge as opposed to rote learning.

Passmore advises that this sort of skill learning is best accomplished by substituting problems for exercises and drills as early as possible, and by developing in the classroom an enthusiasm for the give and take of critical discussion. Passmore asserts, the teacher who has not puzzled his students has failed to educate them.[13]

4.23 Summary and Conclusions: Critical Spirit

Passmore, like Hare, sees a particular attitude as a necessary condition of education. The educated person not only has the knowledge of the various disciplines, but approaches those disciplines with a critical spirit. Because the critical spirit may involve questioning norms, standards and values, opposition may be encountered. Thus the critical thinker must possess certain attitudinal virtues, including initiative, independence, courage, and imagination.[14] Richard Paul offers a more elaborate breakdown of the sorts of virtues associated with critical thinking.

4.3 Strong Sense Critical Thinking

Paul distinguishes between a weak and a strong conception of critical thinking.[15] Critical thinking in the weak sense consists of a list of skills. Such skills, as Passmore has noted, can be misused. Paul's strong sense of critical thinking includes skills and intellectual virtues. Paul states "... the strong sense ought to be our guide for understanding not only the nature of the educated person but also for redesigning the curriculum".[16]

4.31 The Root Notion of Paul's Strong Conception

According to Paul an educated person possesses three qualities:[17]

1. Fairminded independence of thought.
2. Genuine moral integrity.

3. Responsible citizenship.

These qualities are the aims of teaching which fosters the development of intellectual/moral virtues or traits. Paul appears to believe that these qualities are sufficient in terms of describing an educated person, which leads to some problems with his notion of redesigning the curriculum. These problems are addressed below in section 4.32.

Paul identifies seven interrelated intellectual virtues.[18]

1. Intellectual humility: recognition of the limits of one's own knowledge, sensitivity to bias, prejudice.

2. Intellectual courage: willingness to face and deal fairly with opposing ideas.

3. Intellectual empathy: willingness to place oneself in another person's place in order to understand that person's position.

4. Intellectual good faith: integrity.

5. Intellectual perseverance: willingness to pursue "rational inquiry" in spite of obstacles.

6. Fairmindedness: willingness to treat all viewpoints without prejudice.

7. Faith in reason: confidence that individual and mankind's best interest is served by reason.

The virtues are interrelated in the following way: to develop intellectual humility requires having courage to face one's prejudices. This requires empathy with opposing viewpoints which in turn often requires perseverance. The effort is justified by faith in reason and by fairmindedness. Throughout the process one must be aware of integrity.[19] This in turn requires the recognition that one has a responsibility to give fair consideration to opposing viewpoints, bringing one back full circle, to intellectual humility

again. Thus the development of any one of the virtues necessarily involves the development of the others.

4.32 Criticisms of Traditional Curricula

Paul advocates redesigning the school curriculum in order that the development of the above virtues can be fostered. He is critical of traditional curricula for being "highly compartmentalized" with teaching committed to "speed learning" resulting in "superficially absorbed content", and "intellectual arrogance."[20] Paul also refers to the problem as "right answer inculcation" the result of "being told and coming to expect to be told what to believe" and "being told and coming to expect to be told what to do."[21]

Generally, Paul appears to be concerned that rote learning is passing as knowledge. He cites Bloom's taxonomy, which characterizes knowledge as mere recall of facts. According to the hierarchy of this taxonomy, knowledge presupposes understanding, analysis, synthesis, and evaluation. But, as Paul argues, beliefs without reason, judgement, and understanding behind them are mere prejudices, not knowledge. Knowledge is not data to be distributed; it is an achievement constructed by the learner.[22] The similarity of this view with McPeck's notion of taking ownership of knowledge, and Passmore's notion of knowledge as skill is noteworthy. Paul asserts that the achievement of knowledge presupposes minimal comprehension, application, analysis, synthesis and evaluation.[23] The incorrect view

of knowledge as distributable data is at the root of the problems of right answer inculcation and superficial learning.

The problems associated with Paul's insufficient characterization of the educated man arise with his criticisms of the compartmentalization of school curricula. Paul sees teaching for the intellectual virtues as a way of "integrating" the curriculum.[24] Such integration is necessary because "... the moral, social, and political issues we face in everyday life are increasingly complex."[25] Teaching for the intellectual virtues involves making "our own minds and experiences ... the subjects of our study and learning."[26]

Students are to analyse experiences, their own and others', with the following three questions.[27]

1. What are the raw facts, the most neutral description of the situation?
2. What interests, attitudes, desires, or concerns am I bringing to the situation?
3. How am I conceptualizing or interpreting the situation in the light of my own point of view? How else might it be interpreted?

Paul advises giving students a large range of tasks requiring such analysis. Students are to have opportunities to argue among themselves about their interpretations. Each student is to amass a catalogue of such analysed experiences which will form the foundation for intellectual character traits.[28]

Two problems center on Paul's use of the words "experience" and "integration". Paul obviously believes that education should involve the acquisition of knowledge, as is indicated in his comments on

Bloom's taxonomy. Given this, his statement "our minds and experiences become the subject matter..." seems too strong. Perhaps by "experience" Paul means ensuring that students take actual ownership of knowledge.

Assuming Paul is committed to education as acquisition of knowledge, there is also a problem with his notion of integration. Paul Hirst has argued that there are seven logically distinct forms of knowledge, each with its own language and rules.[29] While philosophers differ with Hirst as to details, in order to prove the case for integration of knowledge one must show how all types of knowledge can be reduced to the knowledge of one language and one set of rules. Presently, no such unifying principle has been discovered or articulated.[30]

School subjects need not and do not mirror the forms. Science is a form of knowledge. Physics, chemistry and biology are subjects within that form. It is logically possible to integrate such subjects precisely because they are derived from the same form of knowledge. Social Studies is an interdisciplinary field, drawing from more than one form of knowledge, including history, science, and morality. Interdisciplinary fields involve relationships between different forms of knowledge.

Hirst acknowledges:[31]

> Perhaps the most persuasive case against traditional subjects comes from their lack of explicit attention to the immediate practical and moral problems all pupils do and will face.

Hirst's example is similar to Paul's rationale for integration. Hirst argues, moral and social issues often require knowledge from several different forms. This suggests a need to emphasize relationships between different forms, whereas traditional curricula often emphasize differences. This does not necessitate a new non-subject curriculum[32]. For example moral education could be introduced as a subject which presupposes learning from other subjects, in the way that physics presupposes learning from mathematics. Or, it could be introduced as a subject whose objectives include knowledge from more than one form as in the case of social studies.

Paul's criticism of compartmentalization may well be accurate in the following sense: we may be doing too little to ensure that students understand the interrelationships between different forms of knowledge and different subjects. However, curriculum integration is not a logically viable solution to this problem.

4.33 Summary and Conclusions: Strong Sense Conception

Paul has stressed the important relationships between critical thinking, the concept of knowledge, and education. He has emphasized the virtues necessary for the acquisition of a certain quality of knowledge. His characterization of the educated man is insufficient in the sense that he ignores the necessity for a breadth and depth of knowledge, involving initiation into the recognized forms of knowledge or disciplines. As Passmore observes, many nineteenth century radical workmen possessed the qualities of being independent,

critical, and capable of solving problems, but they were not educated.[33] There is more to being educated than becoming critical, thus curricula must be designed and redesigned according to more criteria than those which aim at developing critical thinking. Such criteria must also include reference to the development of knowledge in breadth and depth.

4.4 Summary and Conclusions: Dispositional Conceptions

In each of the above three conceptions, the necessity of a certain attitude or trait accompanying the acquisition of knowledge was emphasized. The concern with reasons to back up knowledge claims appears to be a common concern of the various conceptions of critical thinking analysed so far. It is also clear that critical thinking is a double-barreled concept, consisting of a cognitive and an attitudinal component. Siegel recognizes this aspect of critical thinking in his rationality conception of critical thinking, which is discussed in the next chapter.

CHAPTER 5

The Rationality Conception of Critical Thinking

5.1 The Root Notion

Siegel defines a critical thinker as one who is "appropriately moved by reasons."[1] Since a rational thinker believes and acts on the basis of reasons, there must be a close conceptual connection between critical thinking and rational thinking, argues Siegel. He concludes that critical thinking is best conceived of as the educational cognate of rational thinking.[2]

There are two problems with this definition; it is in one sense too broad, and in another sense too narrow. It is too narrow in the sense that it implies that critical thinking exists as an achievement term only. Clearly, it is the achievement sense of critical thinking that we wish to aim for in education. But we must also recognize the possibility of a person engaging in the task of critical thinking without being successful, that is, without being appropriately moved by reasons. For example a person may struggle for a long time while developing a theory. Do we wait until the theory is proven before judging whether or not that person has engaged in critical thinking? What if the theory is subsequently disproven? Do we then say that the person had never engaged in critical thinking? Clearly critical thinking, like thinking in general, must exist in both a task and an achievement sense. While the primary concern for education is critical thinking in the achievement sense, our definition of the term

must acknowledge the possibility of critical thinking in the task sense.

Siegel's definition is too broad in the sense that he claims that critical thinking is the educational cognate of rational thinking. While there is a connection between critical thinking and rationality, given that both have to do with reasons, the connection is not as strong as Siegel claims it is. The aim of critical thinking may be to arrive at the most rational decision possible in a given set of circumstances, however, not all rational decisions require critical thinking. Indeed we might question the rationality of a person pondering too long in critical thought over a relatively routine, yet rational decision, or over a decision which has to be made quickly during an emergency. In routine or emergency situations, a person may indeed be "appropriately moved by reasons" without doing any critical thinking. Critical thinking is thus best conceived of as a component or subset of rationality. As McPeck states, "... to argue as Siegel does, that rationality is co-extensive with C.T. [critical thinking] not only flies in the face of ordinary language, but it leaves one to defend the view that brushing one's teeth is a instance of C.T. [critical thinking]."[3]

5.2 Two Components

Siegel analyses critical thinking into two components, reason assessment, and the critical spirit.[4]

According to Siegel there are two kinds of principles of reason assessment: subject specific and subject neutral. Thus Siegel recognizes the value of both subject neutral logical skills (formal and informal) and what McPeck refers to as subject specific skills of his epistemological approach. Siegel claims that there is no a priori reason for regarding either of these as more basic or irrelevant.[5] But Siegel justifies critical thinking by appealing to R.S. Peters' concept of education as initiation into the various forms of knowledge or disciplines. "One plausible account suggests that a person learns the proper assessment of reasons by being initiated into the traditions in which reasons play a role. Education, on this view, amounts to the initiation of the student into the central traditions."[6] Given the setting of critical thinking within this concept of education as initiation into the central traditions, it would seem that subject specific principles have far more significance than subject neutral principles.

Siegel's notion of the critical spirit amounts to a certain kind of character.[7] One who possesses the critical spirit is inclined to seek reasons, to base judgments upon reasons, to reject partiality and arbitrariness and is committed to objective evaluation. Such a person values certain virtues such as intellectual honesty, justice to evidence, objectivity and impartiality and has a commitment to love of reason. These traits are general, not subject specific. Thus Siegel's conception of critical thinking reflects the double-barrelled

nature of the concept, including both a cognitive and a dispositional component.

5.3 Critical Thinking as a Regulative Educational Ideal

Siegel argues that critical thinking should be a regulative ideal, "used as a basis by which to judge the desirability and justifiability of various features of or proposals for the educational enterprise."[8] He offers a justification of critical thinking as a regulative educational ideal, recognizing that the assumption that critical thinking is valuable presupposes assumptions about education and the nature of the educated person.

Siegel's justification is in four parts. The first part deals with respect for persons. Siegel argues that as teachers we are morally obligated to respect our students as persons.[9] This involves recognizing their demands for reasons. Thus teaching which recognizes the principle of respect for persons is like teaching which is intended to foster critical thinking. This, however, is not a justification of critical thinking. Siegel's argument merely shows that the kinds of teaching involved in teaching for critical thinking and in showing respect for students as persons are similar.

The second part of Siegel's justification deals with self sufficiency and preparation for adulthood. Siegel claims that critical thinking "liberates" students from "unwarranted and undesirable control of unjustified beliefs, unsupportable attitudes, and paucity of abilities."[10] Siegel appears to be making the same

mistake the progressives made when they emphasized such ideals as autonomy, and critical thought. A student needs some subject matter to be critical of. Autonomy presupposes choice, which presupposes knowledge of a set of rules to choose from. Similarly critical thinking presupposes some subject matter to be critical with. Indeed the Greek notion of a "liberal education" was based on the belief that knowledge freed man from error and wrong conduct. Critical thinking, as argued in previous chapters, is a necessary condition of knowledge, but it does not characterize the breadth of knowledge implicit within the concept of a liberal education. Critical thinking is thus a necessary, though not sufficient condition of a liberal education, and as such, can be considered to be a regulative ideal of a liberal education.

The third part of Siegel's justification involves a reference to R.S. Peter's concept of education as initiation into the rational traditions.[11] Siegel argues that since such initiation involves learning to assess reasons in each tradition, critical thinking should be considered as an educational ideal because it ... "fosters traits, dispositions, attitudes and skills necessary to successful initiation."[12] Critical thinking may indeed be regarded as a regulative ideal in this sense, given that education is the initiation into worthwhile activities.

Siegel's final point is that critical thinking is necessary to democratic living.[13] This justification reduces education to extrinsic purposes. "Schooling" may well be concerned with the

development of citizenship and the maintenance of democracy, but "schooling" is not the same as "education".

5.4 Summary and Conclusions: Rationality Conception

Siegel's analysis reflects the double-barreled nature of critical thinking, as consisting of both a skill and a dispositional component. He is correct in recognizing that both subject neutral and subject specific skills are involved; however, he fails to acknowledge the importance of the latter. Siegel fails to equate critical thinking with rationality; however, he is clearly correct in arguing that critical thinking should be regarded as a regulative educational ideal. The conceptual relationship between education and critical thinking is further explored in the next chapter.

CHAPTER 6

Critical Thinking, Education, and Educational Reform

The previous analysis of five conceptions of critical thinking shows numerous differences, but also some important similarities or common elements. Indeed, some of the differences between McPeck's, Passmore's, Paul's and Siegel's conceptions are just matters of emphasis. The common elements of the conceptions are at the heart of the root notion of the concept of critical thinking.

6.1 Critical Thinking: The Root Notion

Critical thinking is a double-barreled concept, consisting of a skill or ability component and a disposition component. Critical thinking is primarily concerned with validating knowledge. This entails distinguishing real knowledge from pseudo knowledge: opinion and information.

6.11 An Old Problem

The "knowledge problem" is not new in education. In 1916, John Dewey was critical of educational practices which emphasized the "acquisition of information for purposes of reproduction in recitation and examination" saying "... this static cold storage ideal of knowledge is inimicable to educational development."[1] The progressive education solution to this problem was to deemphasize the domination of teachers and subjects and to emphasize the individual student's experience as a focus for education. Dewey himself was disturbed with

the result of such reform. He noted that progressive education tended "... to make little or nothing of organized subject matter..." and that "Each (school) experience may be lively, vivid, and "interesting" and yet their disconnectedness may artificially generate dispersive, disintegrated, centrifugal habits."[2] As Hirst and Peters note, the progressives failed to recognize that a virtue such as critical thinking is vacuous unless students are provided with forms of knowledge to be critical with.[3]

6.12 Concept of Knowledge

Critical thinking implies a certain concept of knowledge. Knowledge is seen as an achievement constructed by the learner. The constructive process of taking ownership of knowledge involves the symbiotic interplay of both critical thinking and creative thinking, such that "... imagination is controlled by criticism and criticism is transformed to a new way of looking at things."[4] This process can require the learner to adjust his belief system. Knowledge is seen as revisable in view of counter evidence or counter argument. The concept of knowledge as an achievement involves the recognition that knowledge is not static, that it can change a learner's belief system or outlook.

The concept of knowledge requires a critical attitude on the part of the learner. This attitude is characterized by open-mindedness: a willingness to make up one's mind or adjust one's position in view of

counter argument or counter evidence. The critical attitude is further characterized by the following attitudinal virtues.

1. Courage: to be wrong, to take risks.
2. Empathy: to see issues from another viewpoint.
3. Integrity: to apply the same standards to one's own thinking and the thinking of others.
4. Perseverance: to seek rational solutions to problems, to hold one's own beliefs firmly until the soundness of counter evidence or counter argument is determined.
5. Humility: awareness of the limitations of one's own knowledge.
6. Impartiality: fair consideration of other viewpoints.

The critical attitude is subject neutral. There is no logical reason why such an attitude cannot be transferred across subjects; however, as Hare notes with regard to the open-minded attitude, there may be reasons why certain students will not achieve such an attitude in some areas. For example, religious indoctrination could prevent a person from exercising a critical attitude in religion and in other areas where a conflict with certain religious values is perceived.

The critical attitude alone is not sufficient for critical thinking to occur; one must be able, as well as willing to assess the soundness of evidence and arguments. The ability to assess and evaluate entails understanding the criteria and standards of the form(s) of knowledge in each particular case. The ability component of critical thinking is largely subject or form specific. To the

extent that the forms of knowledge are not mutually exclusive, and school subjects are even less mutually exclusive than the forms, there may be some overlaps between subjects and even between some forms in terms of the ability component of critical thinking. The notion that critical thinking consists only of general skills which could apply to any subject or any form of knowledge is ruled out, however, on the grounds that arguments for the integration of knowledge and transfer of training are unsupportable.

6.2 Critical Thinking: A Necessary Condition Of Education

Critical thinking is a necessary condition of education. As R.S. Peters argues, education involves initiation into worthwhile activities resulting in a valuable state of mind.[5] This valuable state of mind is characterized by the development of knowledge in breadth, depth, and with cognitive perspective. Such knowledge is not inert; it transforms the outlook of the learner. Breadth of knowledge is acquired through initiation into all of the "traditions" or forms of knowledge. Cognitive perspective involves understanding the interrelationships among the different forms of knowledge. This notion of knowledge demands care and commitment on the part of the learner. The concept of education as development of mind in terms of the acquisition of both knowledge and a caring attitude about knowledge amounts to the development of persons. Development is understood to refer to "growth", not "inception."[6] Education is thus understood to involve the growth of personhood, not the creation of

personhood. Education as the development of persons is a value enterprise, involving the acquisition of knowledge, the encouragement of certain dispositions essential to this aim, and the discouragement of those dispositions which may run counter to this aim.

Critical thinking includes cognitive and dispositional components necessary to the acquisition of knowledge. Critical thinking implies a concept of knowledge that is "not inert." It includes some of the skills and dispositions which characterize an educated person. The concept of critical thinking can be viewed as a human excellence: it helps pick out the kinds of skill and disposition which contribute to the development of personhood. Critical thinking is both a necessary condition and an aim of education. It is not a sufficient condition of education in that the concept of critical thinking does not imply knowledge in depth, breadth and with cognitive perspective.

6.3 Pedagogical Dilemma

The notion of critical thinking as both an aim and a necessary condition of education presents a problem. As an aim, critical thinking is something to be achieved or accomplished as a result of education. As a necessary condition, critical thinking must be a part of the educational process, of which one aim is the development of critical thinking! In this way critical thinking is seen as a human excellence which is necessary to the process of education, and which grows and develops as a result of education.

Earlier in this thesis, it was suggested that the apparent circularity problem of seeing knowledge as a necessary condition of critical thinking and critical thinking as a necessary condition of knowledge could be avoided by viewing the relationship between critical thinking and knowledge as a spiral, such that the growth of one encourages and permits the growth of the other and so on. This is only a partial solution to the problem. There remains the question of when and how this spiral begins. The pedagogical dilemma centres on Ennis' question: "At what age can students master critical thinking?" In this case the word "master" may be misleading. The question might be rephrased as "At what age should students begin to formally encounter critical thinking in the curriculum?"

McPeck has stated that critical thinking should not be introduced until secondary school, as the "elementary schools are fully occupied with their efforts to impart the three Rs, together with the most elementary information about the world around them (Indeed some critics contend that they do not manage this very well)."[7] McPeck's reference to "some critics" is possibly of greater importance than he realizes, as shall be seen below. In contrast to McPeck's view, others, including Paul, Hare, and Passmore urge for the early instillation of the critical attitude in one's schooling, in order to avoid the development of undesirable non critical attitudes which accompany "right answer inculcation." Indeed, as stated in chapter three, it is difficult to imagine that a secondary student would be receptive to critical thinking after seven years of uncritical

inculcation in elementary school. Passmore cites empirical evidence from the Australian school system which suggests that students who acquire the habit of accepting unquestioningly all that they are told during their early years in school encounter great difficulty with the more open conditions at university.[8]

How then, do we avoid establishing the "right answer inculcation" syndrome and still provide young students with the essential instruction in the three Rs and basic information which is necessary to form a foundation upon which to develop critical thinking ability? The answer lies not in the addition of new content to the already crowded elementary school curriculum; but rather in the manner in which the existing curriculum is taught. The missing element in most discussions of critical thinking is the recognition that critical thinking is but one type of thinking, which, as seen earlier, is not easily separated from other types of thinking. There are important relationships between thinking, language, and teaching. These relationships must be understood if critical thinking is to be an achievable aim of education.

6.4 Thinking, Language, and Teaching

The relationship between thinking, language, and teaching is explored by Gilbert Ryle in "Thinking and Self Teaching."[9] In this paper, Ryle proposes to define thinking indirectly, in terms of teaching. He begins by noting the polymorphous nature of thinking, and limits his discussion to thinking in the sense of "trying to think

something out"[10], or, problem solving. Ryle notes that the sort of learning desired in education involves more than playing back or parroting information; it involves the application of knowledge.[11] He then presents an example of ten good teaching methods which ensure that this type of learning occurs. According to Ryle, good teachers regularly use the sorts of methods summarized below.[12]

Good teachers:

1. Tell us things in variety of ways, use different media in order to avoid boredom
2. Test us for our ability to apply the lesson.
3. Teach by showing how to and how not to--get us to copy (model)
4. Tease us with Socratic questioning.
5. Get us to practice skills with variations.
6. Lead us part way to the solution of a problem, then leave us to solve it.
7. Cite blatantly erroneous, inadequate solutions for us to correct--mimic our sillier attempts--get us to ridicule them ourselves.
8. Show us easier problems--analogies to use as bannisters for more difficult problems.
9. Break up complex problems into simple components for us to solve, then reunite.
10. When we solve a problem--give us subsidiary or parallel problems to limber up our mastery of original solution.

Ryle does not offer this list as a complete characterization of good teaching, but rather as ten examples from the scores of methods employed by good teachers.[13] Note how the use of these methods would require the student to have reasons of his own rather than the teacher's authority for accepting a belief. Right answer inculcation is not only avoided; it is actively discouraged. Several of Ryle's methods are intended to elicit criticism from the students, both of their own ideas and those of the teacher. Method number 7 has application in promoting "the give and take of critical discussion" as

well as the attitudinal virtue of humility. It is also noteworthy that methods 3, 5 and 6 contain elements of coaching methods. Mortimer Adler recommends that a coaching method of teaching be employed in the teaching of skills, including critical thinking.[14]

> A coach trains by helping the learner to do, to go through the right motions and to organize a sequence of acts in a correct fashion. He corrects faulty performances again and again and insists on repetition of the performance until it achieves a measure of perfection.

Such a teaching method clearly has application for the ability component of critical thinking. Methods 4 and 6 can be seen in terms of Passmore's reference to puzzling students. Such methods help to promote open-mindedness and to avoid the development of arrogance which accompanies a false sense of knowledge. Ryle's notion of good teaching is tied to the concept of knowledge: good teaching is that which aims at the acquisition of knowledge.

Ryle outlines two problem solving situations for comparison, one involving teaching, the other involving thinking. The first situation is a summary of Socrates teaching the slave boy in The Meno. In this situation Socrates teaches a slave boy a proof for a Pythagorean theorem without actually telling the boy a single geometrical proof. Ryle asserts that the boy is successfully led through the problem because Socrates knows what questions to ask, when to ask them, and what answers to accept.[15] In short, Socrates knows X, a necessary condition of teaching X.

Ryle then proposes a sequel to The Meno, as an illustration of a thinking situation. In the sequel, neither Socrates, nor the boy know

the answer to the problem. Progress in this situation would be much slower, because this time Socrates does not know what questions to ask, when to ask them, or what answers to accept. Nevertheless, Ryle claims, it is possible that with some luck, Socrates and the boy might discover the correct answer, because Socrates does have some knowledge of geometry and some knowledge of teaching.[16] Ryle suggests this might be the very method Pythagoras used when he discovered the theorems, except that in asking and answering questions he was his own slave boy.[17]

Ryle concludes his comparison of teaching and thinking stating:[18]

> as A's well charted teaching can occasionally dispel B's ignorance so my uncharted thinking can occasionally dispel my own ignorance. Thinking is trying to better one's instructions; it is trying out promissory tracks which will exist, if they ever do exist, only after one has stumbled exploringly over ground where they are not.

Ryle then argues that language, a necessary condition of teaching is also a necessary condition of thinking. The thinker who is[19]

> trying out on himself, as on his inner slave boy, things of the sorts that constitute the vehicles by which live teacher A conveys his lessons to live pupil B, he is necessarily operating overtly or ... just in imagination <u>with</u> and <u>on</u> such things as words, sentences, diagrams, signals, gestures, etc.

Two kinds of language can be distinguished, general and subject specific. General language involves, among other things, reasoning ability. As Barrow argues, to understand the word "because" is to understand a causal relationship.[20] Indeed, Oscanyan argues that preschool aged children begin to acquire reasoning ability as they acquire language. He cites transcripts of conversations in which

young children use and understand some basic logical forms, such as the conditional.[21] Thus children begin to acquire some proficiency with the logical operators identified by Ennis as they acquire ability to use language, and without formal instruction in "critical thinking" or "reasoning."

Language can also be considered on a subject specific level, as in Hirst's forms of knowledge thesis. According to this thesis, each form of knowledge has its own language.[22] Hence McPeck's point that a minimal condition for understanding good reasons is an understanding of the technical or specialized language of the particular field.[23]

There are thus two necessary conditions of being able to think through a problem. First, the student must have experienced good teaching of similar kinds of problem. Second, the student must have been initiated into the language of the form(s) of knowledge relevant to the problem. In terms of Richard Paul's concerns about a compartmentalized curriculum, the implication here is that if students are to be able to think their ways through interdisciplinary problems, they must be provided with coaching and practice in solving those sorts of problem. This amounts to ensuring that students gain knowledge with "cognitive perspective."

6.5 Language and Critical Thinking

There appears to be general consensus that discussion and argument play an important role in the development of critical thinking. Discussion is seen as a way of analysing one's own reasons and beliefs

as well as those of others. Hare argues that there is a logical connection between discussion and open-mindedness such that being prepared to discuss a situation implies that one is prepared to examine one's position critically.[24]

6.51 Writing and Critical Thinking

Discussion implies consideration of various viewpoints. It is possible to discuss a topic alone, in the form of writing. Term papers and formal essays have traditionally been used to ensure application of knowledge; however, traditional teaching methods have not always involved providing the student with much guidance in the actual task of writing. Often essay assignments in schools have followed a "teacher assigns, student writes, teacher marks" chain of events. Students receive little assistance with writing other than instruction in grammar and technical skills.

Recently this situation has been changing, with the introduction of new pedagogy for teaching writing known as the "process" approach. Richard Coe's summary and analysis of the "process" approach shows this teaching method to be of immense value in the fostering of critical thinking in students.[25] In the "process" approach writing is seen as a series of steps: motivation, generation of material, drafting, reformulation, editing, and publication. The teacher is seen in the role of a coach, guiding the student through each step. Writing is treated as a communication problem, with the student selecting information and a format to suit the purpose, audience and

occasion. In this way writing is seen as a creative process brought about by critical selection and arrangement of ideas and information. Particular emphasis is placed on the reformulation stage. Students are encouraged to discuss their ideas and to collaborate in their revisions.

The "process" approach incorporates several elements which are important to the development of critical thinking, including the notion of the teacher as a coach, and the recognition of the "dovetailing" of critical and creative thinking. It also involves treating writing as a problem solving activity, rather than a teacher-generated exercise. In this way students are encouraged and enabled to take ownership of their own writing. In short, this method of teaching writing appears to be a good way of encouraging critical (and creative) thinking.

Indeed, as Barrow argues, "To improve the child's command of language is at one and the same time to improve his powers of thought."[26] According to Barrow, writing, as opposed to speaking, listening, and reading, is a particularly important form of language for schools to concentrate on because it can be scrutinized closely and carefully.[27] Not only can it be scrutinized, it can be coached and taught such that the teacher who coaches a student to improve his writing is also coaching the student to improve his thinking, critical and creative. Writing is also of importance in that it can be used across the curriculum to promote critical thinking in various subjects and in interdisciplinary studies.

6.52 Reading and Critical Thinking

In the above section, it has been argued that learning to write well involves learning to think well. Phillips and Norris argue that "reading well is thinking well."[28] This conclusion is based on an empirical study involving forty elementary school children. These students were interviewed as they read a passage line by line. Good readers (those able to comprehend the passage) tended to generate a hypothesis about the main idea of the passage, based on the limited information provided in the first line. As they read further, these students tended to test, and when necessary, adjust their initial hypotheses, on the basis of the additional information of successive lines of the passage. Poor readers also generated an initial hypothesis, but they did not test and adjust this hypothesis as they read, and were thus unable to comprehend the passage. For example a passage which began with a reference to some men going "down the bay" was initially interpreted by one reader to be about a sailing or water skiing trip. A second reader focussed on the word "bay" and hypothesized that the men were going shopping for clothing at the Bay, a department store. Successive lines referred to a net, the skipper, the catch, cutting and gutting. The first reader used this information to adjust his hypothesis, and concluded that the story was about some men who went fishing. The second reader adhered rigidly to the shopping hypothesis, and was unable to explain what nets, cutting, gutting etc. had to do with shopping for clothing in a department

store. Phillips and Norris thus conclude that good readers think well and poor readers think poorly.[29] The implications are that there can be little distinction between testing for reading and testing for thinking, according to Phillips and Norris. They contend that there are important overlaps between the reading and thinking fields in terms of the following areas:[30]

1. Knowing what information to use in solving a problem.
2. Criteria of appraisal.
3. Dispositions.

6.53 Empirical Evidence About Language Teaching

If writing well is thinking well and reading well is thinking well, then it is vital that these two Rs be taught well. As McPeck has hinted, there is evidence that this is not the case. Numerous studies indicate that emphasis in reading and writing instruction and testing during the past decade has been placed on mechanics, not comprehension and composition.

Frank Smith asserts that reading comprehension involves two skills "the prediction of meaning, which involves relating the unfamiliar to the already known, and the parsimonious use of visual information."[31] He states that the only way to learn and practice these skills is quite simply by reading.[32] This certainly fits with the notion of good reading presented by Phillips and Norris: it is only by actually reading through a passage that students can practice generating and testing hypotheses. In spite of the apparent tautology that reading

is best learned by reading, there is evidence to suggest that this is not reflective of classroom practice. MacGinitie and MacGinitie have observed that the emphasis in reading instruction is on mechanics.[33] They suggest that this is possibly due to the fact that mechanics are easier to systemize, and that the rules for right answers are more clearly prescribed in teaching mechanics than in teaching comprehension. The result, say MacGinitie and MacGinitie is that students probably spend more time on exercises and less on reading. Indeed according to Smith the average hour of reading instruction involves only four minutes of reading![34]

MacGinitie and MacGinitie observe that although most basal reading programs contain many comprehension questions, there is little in the way of suggestions to the teacher on how to teach comprehension to the student who is having difficulty.[35] The situation is even worse in "content" areas according to MacGinitie and MacGinitie where well meaning teachers appear not to recognize the difference between "... helping students understand the content of the text and helping students understand the text."[36] Typically, teachers engage in the former activity, when they should be doing the latter, assert the authors. This habit amounts to teaching students not to read, claim MacGinitie and MacGinitie.[37]

The situation appears to be similar in the case of teaching writing. Goodlad's comprehensive study of schools involved comparing the goals of schools to what actually occurred in the classrooms. Most schools had goals which included "[developing] the ability to

communicate ideas through writing and speaking, develop the ability to use and evaluate knowledge, and, develop positive attitudes toward intellectual activity, including intellectual curiosity and a desire for further learning."[38] These goals implied to Goodlad a picture a students "... writing essays and narratives, engaging in dialogue with one another and with their teachers, initiating inquiry into questions not resolved by teachers or in their own minds and so on."[39] But the observations produced a different image. English and language arts instruction involved a heavy emphasis on basic skills throughout the grades. Students completed workbook exercises and answered quizzes and tests requiring short answers. Dialogue, and the writing of paragraphs and essays were seldom observed.[40]

6.54 Language Testing and Testing for Critical Thinking

Goodlad states: "The tests teachers give reflect what they believe to be important and convey to students the kinds of things they are expected to learn."[41] Evidence suggests that not only is language teaching inadequate in terms of the development of critical thinking ability, but there are also problems with language testing. Standardized tests which assume a basic skills conception of reading and writing test basic skills, not comprehension and composition. Cooper's summary of data from SAT scores, the College Entrance Exam Board, and the National Assessment of Educational Progress suggests that between 1971 and 1981 basic skills of writing mechanics and arithmetic computation, the main concerns of competency testing

advocates, remained stable.[42] During the same period, written composition and mathematical problem solving ability declined.[43] MacGinitie and MacGinitie note a similar pattern for reading. Test scores for young students who have received a heavy dose of basic skills are satisfactory; scores for older students indicate weaknesses in reading comprehension.[44] MacGinitie and MacGinitie attribute the decline in comprehension to a secondary school curriculum which "deemphasizes writing practice and the reading of literature and content rich material."[45] Thus, it is possible that the basic skills conceptions of reading and writing which are emphasized in standardized tests are influencing teachers' conceptions of reading and writing and how they should be taught.

McPeck notes a parallel between literacy testing and attempts to test critical thinking.[48] Just as literacy can be viewed narrowly, as a set of basic mechanical, and easily testable skills, so can critical thinking be viewed narrowly as a set of skills, for the purposes of testing. This is evident in Ennis' conception of critical thinking, where the concept was tailored to make it fit the requirements of testing. The problem for literacy and critical thinking is the same: a test which is based on a truncated concept will test only within the limitations of that truncated concept.

A case in point is the California statewide social studies test. Weddle reports that the new tests are broken down to include 60% knowledge and 40% critical thinking.[47] This percentage breakdown is difficult to understand. How can one test "knowledge" without also

testing "critical thinking"? Weddle ponders over the possible problem of testing "two things" in one question and trying to determine whether the students answer to such a question is indicative of critical thinking ability or of social studies knowledge.[48] This assumption that critical thinking can be tested separately from knowledge is wrong. It is impossible to separate the two. The California test appears to contain 60% fact recall questions, and 40% "critical thinking" questions, where "critical thinking" is conceived narrowly, as a list of specific skills.

The only way to solve Weddle's concern of knowing why a student answers a question in a particular way is to have the student explain his answer, either orally or in writing. This could be accomplished with an essay question. The California test includes essay questions; however, these are optional, and are not used in statewide testing due to practical and economic problems with marking.

The California test also deemphasizes reading. Test writers have avoided writing multiple choice questions with long "stems", and have used reading substitutes such as graphs, maps, timelines, tables, and political cartoons. This has been done in order that reading may be tested separately from critical thinking.[49] Thus, it is apparent that the writers of this test do not recognize the relationship between thinking and reading, as outlined above.

Clearly, the sort of critical thinking tested in the California statewide social studies test is not the sort of critical thinking outlined earlier in this chapter. The writers of this test have

conceived of critical thinking as a list of skills which can be appended to a factual recall test. They have not taken into consideration the important relationships between critical thinking and knowledge, language, and teaching.

6.6 Summary and Conclusion: Critical Thinking, Education, and Educational Reform

Critical thinking is a double-barreled concept, consisting of both cognitive and dispositional factors used to assess the soundness of arguments and evidence in the pursuit of knowledge and truth. Critical thinking and knowledge are interrelated such that the development of the former encourages and enables the development of the latter, which encourages and enables the further development of the former, and so on. Because of this special relationship with knowledge, critical thinking is both a necessary condition and an aim of education. The development of critical thinking ability is directly related to the ability to use language, thus the teaching of reading and writing are particularly important to the fostering of critical thinking. Good teaching is also required. There is empirical evidence that current teaching and testing practices in the language arts is inadequate in terms of achieving the aim of developing critical thinking.

The example of California's statewide social studies test is illustrative of Richard Paul's assertion that "We need new criteria of what constitutes success and failure in school."[50] However, Paul's

suggested solution, redesigning the curriculum, is to be avoided; it is frighteningly similar to that of the progressive education movement. In terms of educational reform, critical thinking is, when misconceived, unhelpful and potentially dangerous.

If it is to be of value to education, critical thinking must be understood in terms of its relationships with thinking in general, language, knowledge, teaching, and education. To the extent that the empirical research cited in this chapter is a true reflection of current educational practice, there may indeed be a need for educational reform. Such reform would involve ensuring that the criteria for success in schools measure acquisition of knowledge, not rote acquisition of facts. Recognition of the importance of the development of language ability across the curriculum is also an essential part of such reform. The value of the concept of critical thinking is chiefly as an indicator of the possible need for the kind of reform outlined above. Critical thinking does not imply radical educational reform, but rather such reform as is necessary to bring educational practice closer to educational theory. The ideal of critical thinking does not demand the restructuring of the curriculum; it does demand that the curriculum be taught in such a way that knowledge, the central concern of education, is indeed achieved.

Notes

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