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Critical thinking in education: What can the matter be?

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CRITICAL THINKING IN EDUCATION:

WHAT CAN THE MATTER BE?

by

Gail Lenning

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of the requirements for the degree of

Master of Arts

in

Ethics and Policy Studies

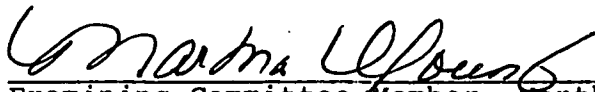
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July, 1990

APPROVAL PAGE

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ABSTRACT

Critical Thinking in Education: What Can the Matter Be?

exposes the problem uncovered by the National Assessment of Educational Progress that American children and young adults lack higher order thinking skills, that they cannot reason. The paper then presents expert commentary on this issue, where informal logic and philosophy are found to be the favored approaches to the teaching of critical thinking. This is followed by the interpretation and evaluation of the two major types of programs used to teach critical thinking skills as well as an examination of the Clark County School District's answer to the problem.

Professor Matthew Lipman's Philosophy for Children program is explained as a specific class intended to teach children to reason by means of a dialogical, philosophical approach. Evaluation will determine that this is a successful program which is used in elementary through secondary schools internationally.

Thoughtful teaching or the across-the-curriculum approach will be explained as to its basic parts, which are a selection of skills and a teaching method to introduce them. There is no universally accepted way of doing this plan, but Richard Paul's successful approach is presented.

The history of the Clark County School District (CCSD)'s critical thinking plan is detailed, followed by an analysis of its current status and contents. The CCSD Teaching Strategies for Thinking manual is evaluated.

Finally, recommendations are made to the Clark County School District for the formation of a workable, organized, practical critical thinking policy.

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I. Introduction

Chapter 1

A. The Problem

There is a strong need for the teaching of critical thinking throughout our school system today.

The intellectual possibilities of the American school child remain largely unrecognized and explored. We teach him to think about various subjects--English, history, social studies, and so on. But we do not teach him to think about thinking, although he is capable of doing so and would be interested in doing so. We do not sufficiently encourage him to think for himself, to form independent judgments, to be proud of his personal insights, to be proud of having a point of view he can call his own, to be pleased with his prowess in reasoning. [1]

In its 1987 reports on American literacy, the National Assessment of Educational Progress (NAEP) gives frightening statistics about the levels of reasoning ability of young Americans. Only small percentages of young adults and children can reason effectively although both have a larger percentage when confined to surface understanding.

In the 19th century, literacy was defined as an ability to read and write, typically reading the Bible and writing one's name. But with recent societal demands, the NAEP convened panels of experts who adopted the following, more contemporary definition:

[Literacy means] using printed and written information to function in society, to achieve

one's goals, and to develop one's knowledge and potential. [2]

This definition indicates far more than acquaintance, or simply having heard of something. It involves doing something with the information, or even having to figure out how to find it.

Literacy, therefore, is not simply reading, or reading plus writing, but an ability to use print for personal and social ends. It is a functional skill in that it requires the application of various skills in common, everyday situations. In this sense, the phrase "functional literacy" is redundant in that literacy, by definition, is a functional ability. [3]

An example of this is found on the Document Scale of the literacy assessment. This task involved the use of a bus schedule. Only 20% of the group determined the length of the wait for the next bus if a bus were missed on a particular day and time. The apparent complexity of the schedule stymied the majority of the group although the schedule was quite typical (Kirsch and Jungeblut 1986, 26).

The literacy study was designed with the beginning difficulties on a low level, which would indicate literacy in the old sense. The tasks then became increasingly more difficult as they took on the thinking skills of listening and cognizing. This graduated testing structure was necessary because literacy is not a simple identifiable skill. That is, it is not simply vocabulary, for example, but vocabulary plus what to do with it. There are

relationships, gaps. One must ask what he needs to know or provide the connections.

For these reasons, too, people cannot be classed as simply being functional or not. No single skill determines life survival, holding a job, making the economy productive, making democracy work, or raising children. As three students of these NAEP tests explain,

Literacy is also a continuum of skills, not an all-or-none ability. One can define arbitrary levels of performance for designating discrete literate or illiterate categories, as is often done in national surveys, but this obscures the true literacy issue, which is what people can do and how these abilities relate to particular social needs. [3]

With modern technology and economy, it is necessary not only to operate a system, but to solve problems or revise systems. This means young people must reason effectively in order to understand the things they read and transform these ideas into written work or personal adaptation.

America's labor market, its military, and its political and economic processes require citizens with relatively high levels of critical thinking/reading skills. The continuing process of economic and social change which America has experienced at least since the end of World War II, and which most certainly will continue through the remainder of this decade and probably the next, requires citizens who can adapt to change, whose literacy skills allow them to master new jobs, new economic structures, and new political structures (Venezky, Kaestle, and Sum 1987, 7).

B. THE NAEP SCALES

The reason literacy in this current sense is seriously lacking among young people is understood through a summary of the NAEP study. The assessment was conducted using a group of about 3,600 young adults, aged 21 to 25. Interviews of 90 minutes were conducted by 500 interviewers. About one hour of the time was spent on measuring proficiencies, and the remaining 30 minutes "were devoted to obtaining background information that could be related to performance on the simulation tasks. Questions focused on the respondent's current reading and writing activities, occupational status and aspirations, educational and early language experiences, and home characteristics." (Kirsch and Jungeblut 3) The system of classification used in the assessment was a grouping of three "literacy scales":

1. PROSE LITERACY -- the knowledge and skills needed to understand and use information from texts that include editorials, news stories, poems, and the like;
2. DOCUMENT LITERACY -- the knowledge and skills required to locate and use information contained in job applications or payroll forms, bus schedules, maps, tables, indexes, and so forth; and,
3. QUANTITATIVE LITERACY -- the knowledge and skills needed to apply arithmetic operations, whether alone or sequentially, that are embedded in printed materials, such as in balancing a checkbook, figuring out a tip, completing an order form, or determining the amount of interest from a loan advertisement (Kirsch and Jungeblut 1986, 4).

1. In the PROSE category, most of the group (96%) were literate on a simple level. For example, they were capable of locating a single piece of information from a news article, "Swimmer Completes Manhattan Marathon." The question required the reader to find and underline what the swimmer ate to keep up her strength during the swim (Kirsch and Jungeblut 1986, 11); the identical words as were used in the question were there to be found among one's answer-choices. Obviously, when the precise information requested is available in the same or similar words, most young adult American readers were capable of finding it (Again, 96%).

However, with an increase in difficulty, a decrease in ability appeared. For example, a newspaper article was given which argued that the United States knew that Korean Air Lines Flight 007 was astray. When a synthesis of the argument was requested, only 37% of the group could produce it (Kirsch and Jungeblut 1986, 13). Reasoning was the key to solving this problem. The reader needed to be able to find and paraphrase the evidence provided, the inferences drawn, and the conclusion reached.

The percentage plummeted even further to an astonishing 9% when the sample was asked to express the idea of a four line poem by Emily Dickinson (Kirsch and Jungeblut 1986, 14). Interpreting a metaphor and understanding one abstract idea were requirements for success in this task.

2. DOCUMENT LITERACY

As on the prose scale, the tasks making up the document scale form a continuum of difficulty.

The tasks become more difficult as:

the number of features or categories of information the reader has to locate in the document increases.

the number of categories of information in the document that can serve as distractors (for plausible right answers) increases; and

the information asked for in the question has less obvious identity with the information stated in the document (Kirsch and Jungeblut 1986, 19).

As anticipated, in this category 99.7% of the group were capable of signing their name on the proper line of a social security card (Kirsch and Jungeblut 1986, 19). However, this percentage dropped considerably, to 57%, when a graph was introduced, and the reader had to glean information from it (Kirsch and Jungeblut 1986, 25).

Four bar graphs were used which indicated the estimated U.S. power consumption by source for four different years. There were five power sources on each. Some of the information on these bar graphs was not going to be needed; this sort of unnecessary information is referred to by the scale designers as 'distractors'. The extensive distractors and the series of steps necessary to find the required information were factors in the lower percentage of success.

3. Mathematical operations encompass much of the QUANTITATIVE literacy scale. "Proficiency on this scale seems to be a function of the particular operation called

for, the number of operations needed to perform the task, and the extent to which the numerical task is imbedded in printed material." (Kirsch and Jungeblut 1986, 30)

Totaling two entries on a bank deposit slip was typical of an item on the lowest end of the difficulty scale. A predictable 92% were capable of this task (Kirsch and Jungeblut 1986, 31). But a surprisingly low percentage-- 38%--performed well on a rather typical life situation task. The reader was given \$3.00, asked to read a menu, determine the cost of two lunch items, calculate the amount of change, and then calculate a 10% tip (Kirsch and Jungeblut 1986, 33). It seems sensible to conclude from the 62% failure that the increased number of operations needed to do this task would be the cause why the success level dropped even though the situation was straight forward and should have been familiar.

Another startling statistic was a success rate of only 10% when the reader had to figure the unit price of an item in order to determine the cheaper of two products. The information given was typical of unit pricing found in most grocery stores. The task was to determine the cost per ounce of peanut butter when 20 ounces cost \$1.99. This amount was then to be compared with 11.8 cents to determine which was less (Kirsch and Jungeblut 1986, 34); 90% failed this multi-step task.

In summary of the issues exposed by Kirsch and Jungeblut in their literacy assessment, it is obvious that our young Americans can handle simple tasks when presented one at a time or spelled out in close connection to the desired answer, but are not able to handle even simple tasks when connected in such complexities as are necessary for living in our world today, or when some analysis or synthesis of information is required in order to get to the answer.

The fundamental observation made across these different tasks and assessments is that school students and young adults have adequate abilities for basic tasks, but are poor problem solvers. Confronted with tasks where multiple features must be attended to and distractors ignored, performance degenerates rapidly. Skills can be applied in isolation but not in combination. (Venezky, Kaestle, and Sum 1987, 28)

C. ANALYSIS

1. PROSE: What is it that our young people are not capable of doing? We know that they can read at least on a simple level. One problem area exists when the level of sophistication of language increases---yet that increase seems to correlate with an increased complexity of discussion or information. Another problem area occurs with the shift from identification of a single piece of requested information to the sorting through of extraneous information ("distractors") to locate the specific items requested. In both of these problem areas, reading thoroughly, carefully,

and with active, analytic and synthesizing understanding is obviously lacking in those unsuccessful many.

2. DOCUMENTS: When documents are dealt with, a simple matching of information is easily done, but when distractors are present--an abundance of superfluous details are given or pictured--our young Americans cannot select what is needed from what is not. All the NAEP's choices of documents used for testing purposes were drawn from everyday life. These were things such as bus schedules, maps, deposit slips, and grocery coupons--all essential, unavoidable elements of our daily existence. Since ours is such a society of documents, it is vital for our citizens be able to ascertain information from them and successfully to use them.

The main problem seems to be an inability to focus one's power of attention. The mind must be able to size up a problem situation, determine what it needs to know, and be capable of sifting, sorting, and experimenting until it locates the answer. These intellectual skills are not automatic functions. Merely knowing how to read and write is not enough to acquire these skills.

3. QUANTITATIVE: The young people seem able to do simple mathematical operations, but they fall apart on those that involve several steps, particularly if one step depends on the next. Thus this is another area where

problem-solving skills are required. Here too, it is necessary to read over the situation carefully and then determine what is missing. The next step is to figure out what might work and what might not and decide what the answer must look like. Testing could only be done next; finally the answer is achieved. Clearly again, intellectual skills are necessary for success.

D. CONCLUSION

There is a need for reasoning to be taught in our school system. The testing done by the NAEP exposed a new type of literacy, one that goes beyond just reading and writing and that requires advanced intellectual skills in order to do the things that enable our citizens to function in the daily life of our society.

A well-educated person does not think of himself as possessing an education, any more than an educated scholar thinks of himself as learned. A person whose mind is part of himself and whose thinking is a way of gaining experience is always in the course of being educated. He is not a professional learner but an habitual thinker, and what he knows shows itself not so much in what he remembers as in how he responds to a situation.[4]

The NAEP study encompassed three areas: prose, document, and quantitative. Numerous examples, all of which were ordinary and typical of the things found in everyday existence, revealed that young Americans experience difficulties when confronted with tasks that went beyond the level of being simple and easily identifiable. The skills

needed for success were those that dealt with problem appraisal and problem solving, skills considered to be thinking or intellectual skills.

What does all of this mean? With the literacy demands of the world today, the young people must be taught the skills they need for survival. This means they need thinking skills. They need to know how to reason.

In the chapter that follows, reasoning and critical thinking will be examined and the experts will express their opinions about them.

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Chapter 2

A. Relating Reasoning and Critical Thinking

Chapter One presented a problem centered on the need for reasoning and critical thinking. Thus far we have considered them to be higher order thinking skills, but further defining is necessary. Richard Paul, a widely recognized leader in the national and international critical thinking movement, defines reasoning in the following way:

The mental process of those who reason; especially the drawing of conclusions or inferences from observations, facts, or hypotheses. The evidence of arguments used in this procedure. Reasoning is a form of explicit inferring, usually involving multiple steps. [1]

Reasoning is a process that everyone does. But everyone does not reason well. Critical thinking is the utilization of the skills that enable a person to reason well. The skills, then, are part of the logical progression of steps that are the elements of reasoning well. Although there is not universal agreement on the number of steps involved, essentially the content and order remain the same. David A. Conway and Ronald Munson follow a nine step plan:

- 1) Recognizing the argument--determining what an argument is.
- 2) Analyzing arguments--determining the structure of the argument.
- 3) Evaluating arguments--determining if it is informal,

formal, or complex.

- 4) Judging validity.
- 5) Causal analysis.
- 6) Argument by analogy.
- 7) Errors in reasoning: Fallacies.
- 8) Determining whether it is reasonable or sound.
- 9) Determining the place of vagueness and ambiguity.

[2]

Steps four through seven might be considered as one which would be the evaluation of evidence and inference by means of counter-evidence and counter-argument.

According to Dale Cannon and Mark Weinstein, there are four dimensions to reasoning: formal, informal, interpersonal, and philosophical. They believe all four should be developed more or less together. [3]

Formal reasoning follows patterns of logical inference without regard to subject matter. Definite results are obtained by applying explicit rules to definite concepts and statements. Mathematics would be in this category. Practice in formal reasoning would develop an awareness of consistency and reinforce the use of deductively valid reasoning patterns (Cannon and Weinstein 1985, 29).

Donald Hatcher believes that formal reasoning is the essence of critical thinking.[4] He argues for formal logic to be taught as an absolutely necessary part of critical

thinking because it provides the rules by which the "game is played."

If the supporters of the critical thinking movement desire to lead students beyond making decisions based on feelings, intuitions, cultural bias, or media-based information, I suggest they emphasize the formal nature of rational thought" (Hatcher 1985, 16).

Informal reasoning involves concrete subject matter. It includes the skills of critical inquiry, problem-solving, and rational evaluation. Practice in informal reasoning develops an awareness of the need for clarity, relevance, coherence, and truth.

Interpersonal reasoning involves a responsibility to reason with other people and consider different points of view. A position that is arrived at merits respect if not agreement. Practice in interpersonal reasoning develops the willingness to offer and respond to reasons, the impartial search for truth, a respect for one's opinions and the opinions of others, and a commitment to making common sense (Cannon and Weinstein 1985, 29).

Philosophical reasoning is thinking about thinking. It deals with the clarification and improvement of the tools with which one thinks and reasons about other things.

It is concerned with obtaining a more satisfying version of one's own thinking or of the thinking practiced in a given subject area: a version that is more thoughtful and sensible, more fully examined and clear, more comprehensive, more impartial, free from presumption--what some have called wisdom (Cannon and Weinstein 1985, 30).

All four dimensions must be developed. The relationships among them are under continuing discussion and investigation. It is known that formal logic follows set patterns that are either accepted or challenged and that current textbooks distinguish between formal and informal logic. Most leaders in the field of critical thinking consider formal logic to have a particular, limited role in overall teaching.

* * *

Richard Paul defines critical thinking in the following way:

Critical thinking is 1) disciplined, self-directed thinking which exemplifies the perfections of thinking appropriate to a particular mode or domain of thought; 2) thinking that displays mastery of intellectual skills and abilities; 3) the art of thinking about your thinking while you are thinking in order to make your thinking better: more clear, more accurate, or more defensible (Paul 1990, 545).

According to J. Anthony Blair, co-editor of Informal Logic, there are four main perspectives to critical thinking: political, educational, ethical, and philosophical. [5] Some of these will overlap, and sometimes more than one will be the point of reference by someone advocating critical thinking.

The political perspective of critical thinking deals with motivation. It is Blair's contention that the current interest in this area comes from political times of unrest

like the civil rights movement and post-Watergate periods. This promotes the idea of students being critical of political policies, of questioning the actions of their government or officials.

The educational perspective has three components. The first aspect connects democracy and education. According to this view, an aim of education is to produce citizens who want to keep democracy safe and sound. This requires people who can and will think, judge and act for themselves. The second aspect of the educational perspective deals with the idea that understanding requires sophisticated analytical skills and an ability to assess the evidence or other kinds of support for a point of view. The final educational aspect relates to the problem shown in Chapter One, that our children and young adults are not capable of doing tasks that are not simple and easily identifiable. This has created the so-called "crisis in education" (Blair 1987, 3).

The ethical perspective relates critical thinking to classical ethical arguments. Blair contends that there is an Aristotelian conception, and according to it, critical thinking is partly an intellectual virtue and partly a virtue of character. "It requires the virtues of thought--of intellectual curiosity, reflectiveness, clarity, analytical and dialectical competencies, and the ability to understand principles and apply them. It also requires the virtues of character--of open-mindedness, perseverance, and

self-examination." Blair also mentions a Kantian argument that starts from the premise that critical thinking is a necessary means to self-sufficiency and autonomy (1987, 4).

The philosophical perspective refers to the competencies acquired in learning philosophy that are critical thinking competencies if they are transferrable. These would be the tapping into and fostering of curiosity about ideas, a passion to understand, and a sense of wonder (Blair 1987, 5).

It is obvious, then, that critical thinking covers a wide range of skills that relate to the ability to reason well. In Part II of this paper, we will examine programs that profess to teach these abilities to school children. But, first, it is important to know what the experts see as a course of action.

B. The Experts Comment

Federal studies show that our children are in intellectual trouble. Analysis indicates that more must be done to teach them to reason well, to think critically. But what often happens, according to E.P. Brandon, is that educators promote these worthwhile skills while doing virtually nothing about them. He sees the problem happening when the leap is made from the idea of critical thinking to detailed objectives like logic, semantics, data versus hypothesis, and the need for experimental controls. If

these things are to appear in the curriculum, teachers must be able to teach them, but as Brandon points out, "In the schools and teacher training colleges, teachers are neither taught nor ever study reasoning, logic, or informal logic. Points about reasoning are of course sometimes made, but reasoning skills are most definitely to be 'caught' rather than taught." [6]

John Stuart Mill believed in the teaching of logic, though he did not emphasize formal logic. He said that rules are necessary for success, and these particular rules (in his two-volume System of Logic of 1862) "keep your mind clear, and keep you from stumbling in the dark over the most outrageous fallacies." He claimed that an untrained mind is not capable of drawing the proper conclusions from its own experience, and that a person with a trained mind, if the training is in a special area only, "is only kept right when there are ready opportunities of verifying inferences by facts." Mill stated that practice by itself, even if it is good, is not enough without principles and rules. [7]

Neil Lane and Susan Jones say that the same basic rules of logic govern rational thinking in any area of learning. A person with the ability to apply these rules has an increased understanding and confidence in dealing with the various concepts. [8]

Christina Slade believes that logic and philosophy belong in the classroom.

Philosophy is a discipline consisting of formal accounts of reasoning, theories of what it is to think well and rigorously reasoned accounts of various topics. It is not content oriented, but fosters critical thinking. Philosophy seems the perfect discipline to foster reasoning. One specific branch of philosophy, logic, develops the skills of abstraction and formalization, in a fashion which would allow those weak in spatial and numerical concepts to perform well. Philosophy and logic, then, should have a place in the classroom. [9]

There are others that see philosophy as the way to teach critical thinking. Matthew Lipman believes that it is the best way to cultivate children's reasoning. He attributes this to the principles of logic, which make it possible to distinguish better reasoning from worse. He says the philosophy "has long been concerned with the improvement of reasoning proficiencies, the clarification of concepts, the analysis of meanings and the fostering of attitudes which dispose one to wonder, inquire, and seek in various ways after meaning and truth." [10]

Anita Silvers not only believes that philosophy should be taught as a way for children to acquire thinking skills but also thinks that philosophers should get involved with the movement. She cites several reasons for this: 1) philosophers should support any movement in education that increases respect for reason; 2) since philosophers understand the limitations as well as the virtues of reason, they can "provide just accounts of reason's benefits lest excessive claims made on behalf of the teaching of reasoning

by those seeking educational panaceas bring reasoning into disrepute by making unredeemable promises;" 3) if philosophers are not the ones involved in the efforts to teach reasoning to pre-college students, they will be guided by unqualified people who are unable to distinguish between typical thinking patterns and the standards of reasoning to which we should aspire. [11]

Silvers continues by urging philosophers to get involved in the teaching of reasoning in the schools. She says that accepting the opportunity requires courage, persistence, and self-discipline. She warns that philosophers have to work with people that have no philosophical training and that it is sometimes baffling to penetrate the K-12 institutional structure.

Silvers sees the reward as seductive: "The prospect of students who enter college already able to distinguish reasons from conclusion, to construct simple but good arguments, and to detect and discard arguments that are bad." She also says that an early education in reasoning will permit more students to enjoy the study of philosophy (Silvers 1985, 26).

The experts have discussed critical thinking and reasoning. From them, we have determined that teachers need to study reasoning, logic, or informal logic in order to teach these necessary skills. We have also learned that untrained minds cannot draw proper conclusions and that a

rational thinker uses this ability in any area of learning. They have also promoted the idea of using philosophy as a means of teaching the prescribed skills even to the point of involving philosophers in the classroom. In the next chapter, we will examine the Philosophy for Children program, which is one popular choice for the teaching of these complicated skills.

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II. Interpretation

Chapter 3

Philosophy for Children

In 1983, Barry Beyer conveyed in "Common Sense About Teaching Thinking Skills" that "teachers and texts usually fail to provide explicit instruction in what these skills are and how to employ them." [1] He observed that a school that hoped to help students to learn advanced level thinking needed to provide "direct and continuing instruction in how to execute these skills as part of a multi-grade, sequential program." (1983, 44) The Philosophy for Children program offers just this kind of experience for students.

Matthew Lipman, Director of the Institute for the Advancement of Philosophy for Children, is the principal director of the program called Philosophy for Children. In operation since 1972, Lipman's method of acquiring reasoning skills through philosophic dialogue requires a specific class taught by a trained instructor.

This program assumes that in order to think well, the student needs the ability to perform numerous reasoning skills, most of which are best learned through the use of language (i.e., dialogue).

Philosophy is dialogical, and to engage in philosophical dialogue puts a premium on "higher

order thinking skills," simply in order to come to grips with the logical, epistemological, ethical or aesthetic aspects of the problems under discussion. Practice in such discussions fosters the development of such skills in each and every participant. [2]

Lipman realizes it would be absurd to claim that only philosophy cultivates classroom discussions. He does believe, however, that "higher order skills" are more likely to be utilized in philosophical discussions. He says that by devoting part of the school day to this type of activity when a child is in elementary school, the student will be prepared for his future education (1985, 39).

Kenneth Eble agrees that the dialectic or Socratic method is essential to learning how to reason well:

Basically a method for arriving at a firm answer through a series of focusing questions, it rests on an even more basic assumption that thought must be active, must be exercised, in order to develop. It also implies that answers to questions are best arrived at through this strenuous kind of questioning. [3]

Eble (1966, 24) believes that the dialectic approach comes closer than other methods to reaching the central fact of learning between two people. One is inclined to learn from personal, involved interaction between teacher and student. Even if the curriculum and requirements are ignored, if the teacher and pupil are connecting to each other's conversation, they are learning a great deal.

The skills presented in the program include the ability to draw inferences, make distinctions, uncover

assumptions, evaluate reasons, and see analogies. These, Lipman believes, can best be taught by philosophy. By this he does not suggest a formal study of philosophy, but rather that children learn to philosophize. This is accomplished when the classroom becomes a "community of inquiry" where students can engage in dialogue in a spirit of cooperation. [4]

What philosophy does in turn, when added to the curriculum, is to make education genuinely reflective by motivating children to talk to each other in a disciplined manner about substantive matters, and to think objectively about their own thinking (Lipman 1985, 39).

Lipman continues by suggesting that philosophy holds the answers in the development of higher order thinking skills because students need to be proficient in reasoning.

But one cannot overlook the fact that there are social advantages as well. An anemic educational system is bound to produce an anemic democracy, because democracy, alone among political systems, requires a judicious, reflective, participatory citizenry (Lipman 1985, 39).

Another advantage Lipman recognizes in the use of philosophy is the freedom it gives students to discuss issues that are important to them. Often these issues turn out to be ideals that are important to the well-being of society. Philosophy is a treasury of concepts like justice and truth and has a methodology for their objective analysis (Lipman 1985, 40).

Actually there is no set of materials entitled "Philosophy for Children." The program title is an

umbrella term, based on philosophical questioning and exemplified by several related but stand-alone programs. Each program has its own novel (which was created especially for this program), its own teacher's guide, and its own exercises. The students make "discoveries" in the course of reading the novel which are actually the rules of reasoning. The ideas the characters share about thought, thinking, mind, truth, and other philosophical topics come from classic writers like Plato and Descartes. Famous figures and their works are never mentioned to keep the concentration on ideas. The goals are to teach children to reason well and to enjoy thinking for themselves. This is accomplished when the students meet three times a week for forty minutes to read, do exercises, and interact dialogically (Chance 1986, 48).

The minimum training for teachers is a two week workshop conducted by the Institute for the Advancement of Philosophy for Children. The teachers should also have a philosophical bent. There is no way of knowing exactly at the time of this writing how many teachers volunteer or are forced to participate when their school districts follow this program. Since thoughtful dialogue among children is crucial to the success of the program, the teacher must be adept at certain discussion-leading techniques in order to model and

educate reasoning skills. These include the following:

- 1) Eliciting Views--The goal is to elicit the students' opinions on topics of interest to them as found in the reading.
- 2) Clarification and Restatement--The teacher helps the students to express themselves by rephrasing or asking questions about what they have said to get them to see their ideas more clearly.
- 3) Seeking Consistency--The teacher points out inconsistencies in the use of terms.
- 4) Searching for Assumptions--Teachers use a questioning technique to help students search for assumptions.
- 5) Indicating Fallacies--There are criteria by which views may be judged to be more or less reasonable. The teacher is obliged to point out logical fallacies.
- 6) Requesting Reasons--The teacher questions the students to get reasons for their views. If weak reasons are given, the teacher helps the student to find better ones (Chance 1986, 48-49).

The Philosophy for Children program is recognized by the National Diffusion Network of the United States Department of Education as a meritorious educational program, and it has centers or individual representatives in 25 states and 20 foreign countries. It is, however, not the only popular plan for the teaching of critical thinking.

Chapter 4 will examine the "Thoughtful Teaching" or "Across the Curriculum" approach.

Endnotes/ Chapter 3

1. Beyer, Barry. "Common Sense About Teaching Thinking Skills." Educational Leadership (November 1983): 44.
2. Lipman, Matthew. "Philosophy and the Cultivation of Reasoning." Thinking, The Journal of Philosophy for Children 5.4 (1985): 33-40. All further references to this work will be cited parenthetically in the text, with page numbers indicated, as, for example, "(Lipman 1985, 39)."
3. Eble, Kenneth. "Thinking, Knowing, Doing." A Perfect Education. New York: Macmillon Co., 1966. 70-76. Rpt. in Thinking, The Journal of Philosophy for Children 6.2 (1985): 20-24. All further references to this work will be cited parenthetically in the text with page numbers indicated as, for example, "(Eble 1966, 24)."
4. Chance, Paul. Thinking in the Classroom: A Survey of Programs. New York: Teachers College Press, 1986. 48. All further references to this work will be cited parenthetically in the text with page numbers indicated as, for example, "(Chance 1986, 48)."

Chapter 4

Thoughtful Teaching

or

Critical Thinking Across the Curriculum

Rather than offering a specific class, such as Professor Lipman's plan to teach thinking skills, many school districts believe this can best be accomplished by incorporating critical thinking skills throughout the existing curriculum. Since the students ought to be learning and using thinking skills throughout the school day, this approach suggests that thinking skills are integrated with normal coursework. In fact, reasoning occurs in most curricula, if not all, and can be seen and studied there.

The concept is not new. There always have been teachers who considered thinking part of their subject matter. But the idea of incorporating thinking skills into the whole curriculum has received increasing support from psychologists in recent years. Robert Glaser (1984) of the University of Pittsburgh believes that thinking is not learned in an abstract way and then applied as needed. The use of a thinking skill means using it in a particular context. [1]

The implication is that a student cannot learn, for example, "to solve problems"; instead, the

student must learn to solve math problems, science problems, and so on. Similarly, one does not become skillful at critical thinking; one learns to think critically about politics, or science, or law, or whatever it is that one has been taught to think critically about. Thus, the more situations in which students learn to apply a thinking skill, the more situations in which they will be able to apply it. [2]

Canadian psychologist Carl Bereiter agrees that "the promotion of thinking skills should be deeply embedded in the whole fabric of an instructional program." [3]

Thoughtful teaching can be done in hundreds of ways. School districts and even individual teachers may have different ideas about embedding instruction in critical thinking into the curriculum. Although there is no universally accepted plan to examine, all across-the-curriculum approaches involve a selection of critical thinking skills and a choice of methodology.

Ideas for thinking skills can be found by reviewing formal thinking programs or searching through educational or psychological journals. Paul Chance suggests a possible list which is from a hypothetical program that he uses for illustrative purposes.

SELF-TALK--By talking to themselves as they read, recall information, or do problem-solving, students can improve performance on tasks.

IMAGING--This is a way of increasing understanding and recall by imagining relevant items. By using one's

imagination on lecture materials, it is possible to recall the information at a later time.

PARAPHRASING--This is the translation into one's own words of something read or heard. It forces a student to come to grips with it.

SEEKING ADDITIONAL INFORMATION--A lack of understanding comes sometimes from having too little information. Students then memorize instead of seeking additional information which would add clarity to the situation.

MNEMONICS--These are tools to assist in memorization. They might be acronyms, abbreviations, acrostics, or rhymes. The skill involves the invention of mnemonics, not just using another's.

NETWORKING--Material is organized into a type of knowledge map so that one has to think about relationships of facts and ideas. This improves the use of information as well as enhances understanding and recall.

GRAPHIC REPRESENTATION--Information is represented in figures, tables, diagrams, sketches, and the like. These can be used for simplification, recall, and problem-solving.

SIMPLIFYING--Work on a simpler version of a complex problem.

DECOMPOSING--Divide a complex task into small parts. An overwhelming task often is no problem when done this way.

CHECKING--Catch errors, inconsistencies, and other flaws by rereading, looking over one's work, or doing a problem in a different way (Chance 1986, 119-120).

Some additional critical thinking skills may be added to this list depending on the intentions of the teachers or districts. To introduce these skills in the classroom, a wide variety of teaching methods may be used. For example, the work of B.F. Skinner [4], a Harvard psychologist, might be used to base instruction on modeling, prompting, and reinforcing.

Modeling consists of demonstrating the skill to be learned.

Teachers may model imaging by pausing to describe what they "see" while reading a poem or story. Paraphrasing is easily demonstrated by stating the gist of a student comment or a passage in a text... Note that the skills are not modeled in an abstract or hypothetical way removed from regular course content. Rather, these thinking skills are modeled in the process of teaching standard subject matter (Chance 1986, 122).

Modeling allows the student to see what the skill actually looks like. It provides something to imitate but does not insure imitation. This is where the second part of Skinner's method, prompting, is utilized. Prompting means doing something to induce a person to perform some act. Thinking skills may be prompted in various ways.

Students may be asked to imagine the scene depicted in a story that is being read, and the teacher may stop reading periodically to ask the students to describe the scenes they envisage. Likewise, a teacher can paraphrase one paragraph in an essay, then read the next paragraph and ask a student to paraphrase it. When it becomes clear that a student does not understand some concept or relationship, he might be asked to seek additional information. Students can be asked to think up mnemonics to help them remember some rule or fact, to simplify a problem or break it into parts, and so on (Chance 1986, 123).

Prompting is a vital part of thoughtful teaching because students need to perform a thinking skill if they are to learn it. However, practice alone may not be sufficient. Often reinforcement is necessary. The intent here is a system of positive reinforcement or reward upon performance of the skill being learned. Praise, when administered strategically, may be the final phase of the method to acquiring the desired thinking skill.

The selection of skills has been made, hopefully, from the elements of reasoning. The methodology has been determined from accepted educational practices. It is now necessary for the teacher to be trained in order to make this program operational.

Teacher training is extremely important in the successful implementation of thoughtful teaching since all teachers are required to infuse the higher order skills in their classrooms. Some workshops are available in variations of this approach. Teachers must have a superior

grasp of course content as well as of the thinking skills to be taught.

The benefits claimed by advocates of thoughtful teaching are that students acquire facility in the thinking skills taught and can apply them to academic tasks. They also have improved mastery of course content (Chance 1986, 118).

A specially designed version of thoughtful teaching was created for use in the Clark County School District. Chapter 5 A will explain the history of this program and Chapter 5 B will examine its contents and current status.

Endnotes/ Chapter 4

1. Glaser, Robert. "Education and Thinking: The Role of Knowledge." American Psychologist 39.1 (1984):93.
2. Chance, Paul. Thinking in the Classroom: A Survey of Programs. New York: Teachers College Press, 1986. 117-132. All further references to this work will be cited parenthetically in the text with page numbers indicated, as, for example, "(Chance 1986, 119)."
3. Bereiter, Carl. "How to Keep Thinking Skills from Going the Way of All Frills." Educational Leadership 42.1 (1984):75.
4. Skinner, B.F. The Technology of Teaching. Englewood Cliffs, NJ: Prentice Hall, 1968.

Chapter 5

Critical Thinking in the Clark County School District

A. History of the Program

Although studies conducted by the federal government showed that students lacked critical thinking skills, the educational community of the Clark County School District was alerted to this problem several years earlier than 1986 and took immediate action to begin to remedy this threatening situation.

Theron Swainston, who was an associate superintendent in the elementary education division of the school district, was appalled by the 1983 SAT test scores of Southern Nevada students. Influenced by this concern and articles that he had read about critical thinking in educational journals, Swainston first set elementary objectives for the year that pertained to thinking skills and then established a steering committee to look into the course of action to be taken.

Early in 1984, the steering committee of classroom teachers, central office personnel, school administrators, and support staff met. This group of approximately twenty decided to hire a consultant in the area of thinking skills (Sue Bernheisel) and ultimately submitted a plan to the Research and Development Department of the school district. It was there that the Abstract Critical Thinking Skills

Program was written, to be funded as part of the Block Grant Project, Education Consolidation and Improvement Act of 1981, Chapter 2. Formulation of this program took place over several years since constant revisions were necessary to achieve the desired results. It was completed in 1989.

[1]

The design of the original program was to develop critical thinking in three areas: reading comprehension, composition, and problem solving. During the first year of the plan, 1984-85, a model for developing critical thinkers (See Appendix A) and a K-8 scope and sequence chart (not currently available) for thinking skills were developed. A task force of classroom teachers formulated the chart and saw to it that the desired skills were placed in curriculum guides as they were revised. [2]

Seven pilot schools were also involved in the program. [3] The training of the staff began at the end of January, 1985, and the teachers in the seven pilot schools experimented with materials and strategies selected for the development of critical thinkers. [4]

During the second year of the program, 1985-86, two full-time curriculum consultants were responsible for implementing program activities. They presented in-services to train teachers, they reviewed and selected materials, and they set up task forces of teachers to further carry out the plans of the program. At this time, the program was

expanded to include grades 9-12 with major activities as follows: 1) refining of K-8 thinking skills concepts and incorporating of the concepts into district curriculum guides, 2) developing of a scope and sequence chart for grades 9-12, 3) involving pilot schools, 4) developing of evaluation procedures to assess the quality of thinking skills, and 5) training of staff members in the area of teaching thinking skills.

In this, the second year, it was necessary to form a task force of teachers from grades 9-12. [5] They developed the scope and sequence chart for grades 9-12. The critical thinking skills were integrated into district curriculum guides as they were revised. Chapter 5 B will list the specific skills.

Sixteen additional schools joined the pilot program. [6] Of the original six schools, only Harris did not continue. Harris dropped out of the program due to administrative problems that were not related to this program. Selected teachers from the earlier group became trainers of other teachers (Kulas and Laughlin 1987, vi-vii).

During the third year of the program, 1986-87, four objectives were identified: 1) the incorporation of thinking skills into K-12 curriculum guides undergoing revision, 2) the training of key personnel in the area of thinking skills, 3) the establishment of a resource library

to assist teachers in implementing thinking skills, and 4) the refinement of procedures for assessing the quality of thinking skills.

The same twenty-two pilot schools were involved in the program, and the pilot teachers had sixteen hours of training which was focused on developing teachers as trainers of other teachers. The pilot school teachers experimented with assessment procedures and provided feedback. The assessment procedures consisted of a Teacher Self-Evaluation Checklist and Student Self-Evaluation Checklists at the primary, intermediate, and secondary levels. (See Appendices B, C, D, and E)

Another accomplishment of the third year was the printing and dissemination of a bibliography of materials available in the resource library. The entries were categorized under the following topic areas: 1) Thinking Skills: Creativity, Logic, and Problem Solving; 2) Reading; 3) Writing; 4) Mathematics; 5) Study Skills; and 6) Professional. The pilot teachers utilized these materials to enhance classroom teaching strategies (Kulas and Laughlin 1987, vii-viii).

The 1987-88 school year aimed the focus of the program in two major areas: 1) the development of a "packaged" inservice program and 2) staff training.

The in-service program includes videotapes and a facilitator's training manual. Videotapes present

background information, research, and teacher modeling of strategies for classroom implementation. The facilitator's manual includes: information for facilitators; background information; handouts; blackline masters for transparencies; bibliographies; activities to enable facilitators to model each strategy; lesson plans for each strategy at the primary and intermediate grade levels as well as in the secondary areas of reading, language arts, math, science, and social studies; and coaching sheets for feedback of strategy implementation. There were two task forces of Clark County classroom teachers who wrote, revised, and tried out these lesson plans and coaching sheets. [7]

The pilot teachers who participated in training to become teacher trainers helped in the dissemination of information district wide. These teacher trainers presented strategies at both formal and informal in-services. Serving as facilitators, they utilized the "package" inservice program (Kulas and Laughlin 1987, viii-ix).

With the restructuring of the program complete, the Critical Thinking Skills Program was ready to enter its final year and implementation phase.

The major purpose of the Critical Thinking Skills Program was to develop critical thinking skills common to reading comprehension, composition, and problem solving, ultimately focusing on staff development activities and the

continued incorporation of thinking skills into district curricula. There were six main results of the project. [8]

The primary result was that an in-service program entitled Teaching Strategies for Thinking was developed and packaged; this program was printed and placed in 431 facilitator's manuals to be used in conjunction with developed videotapes as materials to assist K-12 teachers with strategies which stimulate students' higher order thinking abilities. An instructional session was held at the conclusion of the 1988-89 school year for selected teachers and administrators to familiarize them with the manual and its use.

Secondly, project files documented that a total of 23 in-service training sessions were conducted by the project teacher consultants for approximately 420 district staff members to enhance their knowledge of and expertise in the implementation of thinking skills activities in the classroom and, in some cases, to provide orientation to the newly developed facilitator's manual.

Thirdly, thinking skills were incorporated into 38 district curriculum documents undergoing revision/development during the school year. Next, a variety of K-12 materials (books, periodicals, teacher manuals, etc.) were purchased and placed in the Thinking Skills Library. The fifth result was that an updated bibliography listing of the Thinking Skills Library's holdings was provided to all

public and nonpublic schools, and the final result was the documentation that indicated use of the Thinking Skills Library by 188 district personnel (Clark County School District 1988, 29).

B. Examination of the Program

The funding for the Clark County Critical Thinking Project ceased in 1989, one year ago. There no longer is a thinking skills consultant. The Critical Thinking Library consists of a few shelves of books located at the Curriculum Services facility on North Ninth Street. According to the "librarian," there is no bibliography available for those books. Every school in the Clark County School District has at least one copy of Teaching Strategies for Thinking, which is the facilitator's manual for the in-service program designed to train teachers to administer critical thinking skills by means of the thoughtful teaching approach. The video tapes which accompany the in-service program were broadcast to all schools in June, 1989, so that each school could record them.

Since the manual is the heart of the program, it is important to know that it contains, essentially, twenty hours (when combined with the tapes) of in-service programs. [4] The manual is divided into six parts: 1) Thinking Skills Overview and Metacognition [thinking about thinking], 2) Direct Teaching of Thinking and Questioning Strategies,

3) Self-Questioning Strategies, 4) Strategies for Optimal Learning, 5) Cognitive Mapping Strategies, and 6) Student-Student Interaction and Divergent Thinking Strategies.

The three major components of the guide are: I. recall, II. understanding, and III. pursuit. There are seven subcomponents: a. memory, b. translation, c. interpretation, d. application, e. analysis, f. synthesis, and g. evaluation. These are based on a hierarchy of questioning [skills] developed by Professor Norris Sanders. [9] His hierarchy, based on Bloom's Taxonomy, appears as an explanation of thinking levels in all curriculum guides that have been developed or revised since 1986, in the Clark County School District. Sanders believes that teachers need to ask questions that facilitate student thinking; Bloom uses questions to evaluate student thinking. The intention of this classification system is to offer a framework for movement from lower to higher-level thinking (Kulas and Laughlin 1987, 1-5). A brief description of each level follows:

I. RECALL

- a. Memory: This involves the recall or recognition of information. Facts, definitions, and generalizations are the content.

b. Translation: The same idea is expressed in a different way. It could be the obvious conversion of a statement from English to a foreign language, an explanation of graphs, or a word problem converted to a numerical notation.

II. UNDERSTANDING

c. Interpretation: The student discovers or uses a relationship that involves facts, generalizations, definition, values, and skills. The types of these include: comparison, implication, inductive thinking, quantitative thinking, and cause and effect.

d. Application: This involves solving a problem by use of generalizations, facts, values, and other types of thinking. The student makes the information selection. Learning is transferred to new situations.

III. PURSUIT

- e. Analysis: By breaking down information into parts, the student can examine the relationships between parts or elements. The student must be aware of the intellectual process he/she used and know the rules for reaching a valid and true conclusion.
- f. Synthesis: A problem is solved using original, imaginative thinking. The student is free to decide what he produces and how it is to be done.
- g. Evaluation: Judgments are made based on clearly defined standards. Ratings may be good or bad, right or wrong, beautiful or ugly. An evaluation answer is never provable. The best that can be done is to present good supporting evidence. [4]

Teachers are given a variety of ways to enhance student thinking. One suggestion is to interact with information

rather than just repeating it. Students are to be encouraged to examine and verbalize their thinking processes. Thinking models are to be provided. This means that students examine the teacher's problem solving strategies or those of famous thinkers. The teacher should encourage students to generate their own questions at a variety of thinking levels. Objectives should be clearly communicated, and learning activities are to be designed to help attain that objective. Teachers should ask questions that facilitate thinking at many different levels. Deliberate, appreciative silence should follow questions so that students can think things through before responding and can elaborate on their answers. Teachers should probe students for more thoughtful answers by encouraging them to clarify, elaborate, and justify. The final suggestion is to develop a "coaching environment" with a colleague who is interested in fostering student thinking (Kulas and Laughlin 1987, 1-16).

In the second section is a twenty-three minute in-service which is quite significant because this lesson presents the sixteen thinking skills that are to be taught in Clark County schools. They are to be viewed as essential for student success in all areas of instruction. The definitions and steps to follow to perform these skills are listed below:

I. RECALL

Thinking Skill: 1. SEQUENCING

Materials or events are organized in a logical sequence for optimum learning. In order to arrange these in the proper order, 1) Decide what items are to be placed in order; 2) Determine the type of order (size, time, shape, etc.); 3) Group the materials or events into the proper order; and 4) Check the sequence created to see if it makes sense.

Thinking Skill: 2. REMEMBERING

This skill is the recall or recollection of information previously memorized. By determining the reason for remembering, retention is assisted. The steps to remembering are as follows: 1) Read the available information; 2) Determine the topic or main ideas and notice the relationships of important facts or details to them; 3) Recite the important data to yourself several times.

Thinking Skill: 3. OBSERVING

This skill is the ability to intentionally examine, study, or search out a condition, act, or event as a means of gathering data. In order to observe, 1) Use all of your senses to gather information; 2) Write down the most important characteristics that have been observed; 3) Find

answers to any questions you have about the observation; and
4) Write a summary of the importance of the observation.

II. UNDERSTANDING

Thinking Skill: 4. CLASSIFYING

Classifying is the grouping of information that has similar characteristics and attributes. Information may be classified into more than one category. This skill is accomplished by the following: 1) Put available information into a list; 2) Look for similarities in the list, and group that data together; 3) Label the groups you have created; 4) Check all categories for consistency.

Thinking Skill: 5. INFERRING

Inferring is being able to arrive at a conclusion or judgment based upon implied facts or evidence. You must use the information given plus your own knowledge and experience to reach the conclusion or judgment. The steps follow for the skill of inferring: 1) Read the information, taking note of facts and details; 2) Determine what information the facts or details give you that is not written; 3) Decide if the information given is true by using your own experience or knowledge; 4) Determine if the author is stating an opinion or factual information; 5) If there is enough time, read other related information to see if the same facts are

given; 6) Based on steps 1 through 5, make your conclusion or inference.

Thinking Skill: 6. DRAWING CONCLUSIONS

Drawing conclusions is the ability to use evidence to state an outcome or results. To draw valid conclusions, the student must be able to think objectively and to make judgments based upon evidence. This is accomplished by the following: 1) Read all available information, noting details and facts; 2) Review the information holistically. Question yourself on the total meaning of the information. Determine the facts and details needed to know the outcome or results that are definitely supported by the materials; 3) By referring to the pertinent facts or details, state or write what you think the outcome or result is; 4) Get feedback. Do others agree with your conclusion? Does your evidence support your conclusion?

Thinking Skill: 7. SUMMARIZING

Summarizing is the ability to do an oral or written condensation of the material. The steps to follow are 1) Read the material; 2) Determine the main idea and important details; 3) Use your own words to draft a brief statement of the main idea and the important details; 4) Review the summary, checking to see that you used your own words and that it was brief and to the point.

Thinking Skill: 8. COMPARING AND CONTRASTING

Similarities and differences are shown. Students could be focusing on objects, events, concepts, theories, and/or generalizations. In order to compare and contrast: 1) Read the available information; 2) Look for similar characteristics and list them; 3) Look for different characteristics and list them; 4) Review the lists to determine whether the items are correctly listed.

Thinking Skill: 9. IMAGING

Imaging means forming a mental picture of a word or event. To determine the extent of visualization, a student might create a drawing, verbalize about the image, or write a description. Imaging is accomplished by the following steps: 1) The teacher states an event or pronounces or defines a word; 2) The students repeat what was said; 3) Students discuss the word or event; 4) Students are asked to form mental pictures of the word or event; 5) The students are instructed to draw or describe their mental image.

III. PURSUIT

Thinking Skill: 10. PREDICTING OUTCOMES

Predicting outcomes means anticipating what could happen before it actually occurs. The ability to predict will be based on prior knowledge or experience. To predict

outcomes, 1) Read the available information, noting relevant facts and details; 2) Review the sequence of events; 3) Determine what will happen next, based on what you know and/or have reviewed; 4) Write the predicted outcome(s) clearly and explain why these seem reasonable to you.

Thinking Skill: 11. USING CAUSE AND EFFECT

Cause and effect is seeing the association between an outcome and the conditions that brought it about. A cause is the reason(s) for some action, feeling, or behavior. An effect is the result(s) of what happens because of these. A cause can lead to more than one effect, and an effect can have more than one cause. The steps include the following: 1) Read all information available; 2) Look for clue words such as "because," "since," "then," and "for." These signal that a cause will follow. Try to determine the reasons; 3) Look for clue words such as "so" and "so what." They signal that an effect will follow. Try to determine the result of some action, feeling, or behavior in the passage; 4) List causes and effects in columns; 5) Review your work to determine whether the effects you have listed logically follow the causes you listed.

Thinking Skill: 12. HYPOTHESIZING

This skill is the ability to construct an idea that can be used for reasoning. The idea might be a question,

statement, or prediction and can be generated from observations, context, or classroom events. After the hypothesis is stated, it is tested through experimentation, observation, or the collection of facts. In order to hypothesize, 1) Observe an event or read information; 2) Isolate an idea which can be used for further study. This could be something of personal interest, it might be information about which you question the truth, or there could be statements that appear to be more opinionated than factual which you would like to test; 3) Put the idea in the form of a question, statement, or prediction; 4) The hypothesis is tested through experimentation, observation, or the collection of facts.

Thinking Skill: 13. ELABORATING

Elaboration is a detailed or complex expansion of a simpler idea or object. Relevant details are added to what is known or given. The steps to elaborating include: 1) Read the information, taking note of facts or details; 2) Determine what additional information might have been given but was not; 3) Add relevant facts and details that you think should have been included; 4) Review the additions to see if you have improved the original idea by expanding it.

Thinking Skill: 14. ASSESSING

Judgments or evaluations are made after the data are gathered. These would be determinations of right or wrong, good or bad, true or false. In order to assess, 1) Read and collect the necessary data; 2) Determine the relevant facts; 3) Combine the facts to determine a collective statement; 4) Determine the criteria that make the phenomenon good, right, or false; 5) Compare the criteria to the facts; 6) Make the judgment.

Thinking Skill: 15. JUSTIFYING

Justifying is the determination that something is right or wrong based on the use of evidence or logic. A student could be asked to justify a statement, behavior, generalization, concept, or philosophy. This is accomplished in four steps: 1) Read the available information; 2) Determine whether you agree or disagree with the information; 3) Find supporting evidence to explain why you agree or disagree; 4) Present the evidence by summarizing the most important ideas.

Thinking Skill: 16. COMPOSING

Composing is the ability to put together parts to form a unified whole. The result could be a sketch, concept, idea, generalization, or philosophy. The steps to this skill

include: 1) Read the available information, noting facts and details; 2) Look for some kind of organizing pattern. Try to determine the general ideas that would form a more unified whole; 3) Isolate and reflect upon the most important parts; 4) Combine parts to create a unified idea or concept; 5) Present the idea orally or in writing (Kulas and Laughlin 1987, 2-11-19).

* * *

The background information for this in-service mainly discusses the value of the direct teaching approach. The skills are then listed and defined, followed by a detailed explanation of how to teach directly according to Barry K. Beyer. A bibliography follows and then the time table for the in-service is given. The actual time allotment for these sixteen skills is less than one minute, all together, when a handout of them is passed out! This lesson does contain twenty-four lesson plans which address the teaching of these sixteen skills.

Continuing the examination of the manual, five in-services are to be devoted to various questioning strategies. More than two and one-half hours explore these techniques. The justification for spending this much time on questioning is its value in extending student thought. Thinking is challenged and guided by skillful questioning.

Questions aid in the processing of information. When skillful questioning is practiced, students are able to remember more for

longer. Research indicates that emphasis on higher cognitive questions generally produces better learning than emphasis on fact questions. When used effectively, questioning is perhaps the best strategy for promoting higher level thinkers (Kulas and Laughlin 1987, 2-50).

Teachers asking questions is an important tool in the classroom. In addition, and considered valuable enough to rate a separate section of four in-services, is the skill of self-questioning.

In order to develop effective, responsible thinkers for the future, students must be exposed to strategies which enable them to exercise their metacognitive abilities. These metacognitive abilities of self-regulation, self-control, and self-direction can be enhanced when students are taught to ask questions before, during, and after learning. When students ask questions as they deal with various learning situations, they provide themselves with information or an awareness of deficits in needed information. Such knowledge is essential if students are to assume major roles in their learning (Kulas and Laughlin 1987, 3-1).

Part 4 is another section of particular importance. The strategies that are presented were selected because they help students to retain more information for longer periods. These are the optimal learning strategies, and they include: Mnemonics, Analogies, Question-Answer Relationship, and Advance Organizers. The four in-services in this section constitute two hours of presentations. As is common to all programs in the manual, detailed instructions for the in-service are given along with handouts and lesson plans for all levels.

This chapter has given a detailed account of the background of the Clark County School District Thinking Skills Program as well as its current status and important contents. In this section we have seen the two basic types of thinking skills programs and the direction taken by this area school district. Section III will evaluate the contents and effectiveness of these programs.

Endnotes/ Chapter 5

1. Serum, Jean, Thinking Skills Consultant, Clark County School District. Telephone interview. 28 November 1988.
2. This group was comprised of the following: Ellen Sloane, Kathy Johnson, Colleen Leavens, Kathy Magee, and Richard Skinner. Magee was the only secondary level contributor.
3. The seven pilot schools involved in the program were Marion Cahlan Elementary School, Helen C. Cannon Junior High School, Pat A. Diskin Elementary School, William E. Ferron Elementary School, Kenny C. Guinn Junior High School, George E. Harris Elementary School, and Vegas Verdes Elementary School.
4. Kulas, Kathy A., and Laughlin, Glady E. Teaching Strategies for Thinking. Clark County School District, Clark County, Nevada, 1987. vi. All further references to this manual will appear parenthetically throughout the text with page numbers indicated, as, for example, "(Kulas and Laughlin 1987, vi)."
5. These teachers were Gary BeDunnah, Daphne Biale, Sharyn Buck, Andree Reed, and Deborah D. Wright.
6. The following elementary schools were identified as pilot schools: Oran Gragson Elementary School, Mabel Hoggard Sixth Grade Center, Lincoln Elementary School, Jo Mackey Sixth Grade Center, Mountain View Elementary School, Vail Pittman Elementary School, C.C. Ronnow Elementary School, Robert L. Taylor Elementary School, and R. E. Tobler Elementary School. The following secondary schools joined the pilot program: Burkholder Junior High School, Chaparral High School, Clark High School, Eldorado High School, Garside Junior High School, Las Vegas High School, and Robison Junior High School.
7. The members of the lesson planning task force included the following: Charlie Germany, Jacques Fleming, Ruth Etnire, Terry Ector, Terry Powers, Felecia Briscoe, and Vijeane Thompson. The task force to develop coaching sheets included the following

teachers: Carolyn White, Carolyn Fazio, Rudy Schiller, Sharyn Buck, John Amundson, Carmen Ross, Pat Holland, and Barbara Fox.

8. Clark County School District. Block Grant Project, Education Consolidation and Improvement Act of 1981, Chapter 2, Final Report, 1987-88 School Year. "Critical Thinking Skills Program." 28. All further references will appear parenthetically throughout the text with page numbers indicated, as, for example, "(Clark County School District 1988, 28)."
9. Sanders, Norris M. Classroom Questions - What Kinds? San Francisco: Harper & Row, 1966.

III. Evaluation

Chapter 6

A. Philosophy for Children

Matthew Lipman's Philosophy for Children program has the ingredients for being a very successful approach to the teaching of critical thinking. The experts have argued for the desirability of teaching reasoning and logic and, in fact, any philosophical activity. Lipman's program commits wholeheartedly to this design. The classroom structure emphasizes a dialogical approach, which is also considered desirable by experts in the educational arena. Another plus would be the value of directly teaching the desired skills in a separate class instead of hoping that they would be learned within normal curricula. This would, at least, guarantee exposure to the ideas and skills presented. An additional advantage would be the time element. Once district funding provided the money needed, teacher training could take place, and within a few weeks the entire program would be operational. What then, if any, are the minuses of this program?

According to Lipman, the "novels [used in his program] are written at a reading level appropriate to the grade level of the student." [1] He refers here to the six novels written for the program that are used at different grade

levels, from third grade through twelfth. Does this mean that remedial level students are not able to understand the content or keep up with the reading? Would higher level students find the material too easy and lose interest?

A key element in this program would be teacher training. The minimum requirement would be a two week workshop. This would seem highly insufficient if the teacher lacked an extensive college background in philosophy, logic, and reasoning. Since few universities require new teachers to have these courses, and since the majority of existing faculty have never taken these subjects, it would seem likely that many of today's instructors in this program would not be qualified to implement this program to its fullest capabilities.

What if philosophy instructors were brought in to teach this program? They certainly would have the background and understanding to carry out the plan. But, here, too, there is a glaring problem. University personnel are normally not trained to deal with K-12 students, particularly those at the elementary level.

Despite these negatives of teaching materials and training, there is a positive side. Instead of having to train all teachers, only a very limited number would require this particular knowledge, perhaps only one or two per school, since only they would teach the critical thinking classes.

In Lipman's plan, the spirit of the discussions is freedom of inquiry. What if the topics became controversial in nature? [2] In any classroom situation where controversial topics enter the discussion, there is the problem of parental concern and complaining. It then becomes the responsibility of the teacher to keep students on task.

In four separate studies done in 1987 and 1988, the Philosophy for Children program was shown to be effective by demonstrating marked improvements on the New Jersey Reasoning Test. These included the following: 1) Schleifer, Lubuis and Caron's study of third and fourth grade students in Quebec, Canada; 2) Jackson and Deutsch's study of K through twelfth grade students in fifteen of Hawaii's public schools in the Windward, Honolulu, and Oahu districts; 3) Allen's study of sixth grade students of the Salem Academy; and Camhy and Iberer's study of third, fourth, tenth, and eleventh grade students in the Austrian public school system. [3]

These statistics still leave a few unanswered questions: a. Is there retention of these skills in the years after taking this program? b. Must a student study this program from elementary through secondary to get the most benefit? c. Is it too late to teach critical thinking in this program to high school students who did not

participate at an early age? d. Is there carry over of thinking skills into the other disciplines?

These are some possible answers to these questions:

a. According to Paul Chance, there is evidence that the good effects of teaching philosophy fade in time if they are not strengthened by continued use. "Lipman notes that the reasoning gains made by students in one study remained intact for two years, but in a four year follow-up, the difference between these students and a comparison group had disappeared." [4]

b. There are no current studies to show that students following this program from elementary through secondary got the most benefit; however, Neil Lane and Susan Jones found the length of exposure to be of critical importance, as "pupils performed better the longer they were involved with it." [5]

c. Although there is no available evidence to support this answer, it is not too late to teach critical thinking to high school students who did not have this program at an early age. This is assumed to be true because many young adults take critical thinking for the first time in college and do very well in these classes. There is a high anxiety factor with this age group which could affect the success of the program, but with an enthusiastic, well-trained teacher, there should be no reason why adolescents could not be

taught critical thinking by means of a philosophical approach.

d. It is reasonable to assume that there is some carryover to other subjects. If English grammar is mastered, then the student is able to understand grammar terms in a foreign language. If fractions are learned in math class, then a recipe using them in home economics is understood. In Kenneth Meehan's evaluation of a Philosophy for children project in Hawaii, "teachers generally indicated that there was carryover of philosophical or critical thinking skills into other subject areas and into other activities in the school day." [6]

In order for this program to be utilized, major curricular changes must be made which would enable an additional class to be offered. The idea of introducing a philosophically based program at the various levels of education might meet with scepticism. A school district would have to be fully committed to this type of program for it to be successful.

B. Thoughtful Teaching

In order for the thoughtful teaching approach to work, several factors are necessary: 1) Both the skills and strategies must be logically organized and follow critical thinking principles. They must make sense to the teacher who is to use them, if they are to make sense to the students;

2) Teacher training must be practical and viable; 3) The school district must be committed to the program.

When Paul Chance presented a list of possible skills, there was no apparent consideration of higher or lower order, whether these were memory tricks or ways to achieve inferences. For example, mnemonics was listed as one of his choices. This is clearly a lower level skill because it is a way to assist in memorization. Paraphrasing was another of Chance's skills. This one is a higher order ability because it aids in understanding and is a necessary part of reasoning. As the NAEP has discerned, American students are already learning how to use lower order skills. Therefore, there is no need to teach them more ways of doing rote memorization or recall. But, since they are not operating on the higher levels, these are the areas that need the concentration. Time and energy will be lost if we do not address this issue.

There also was no connection among Chance's ten skills. This is obvious when he follows the seeking of additional information with mnemonics. The former arises as a higher order skill; the latter is a lower order skill, necessarily prior to discovering one needs more, or new information. In order for a teacher to comprehend and coach reasoning skills, he or she must be able to understand the function of the skills and how they are related in the current curricular program. It should be obvious, then, that a

school district making a selection of skills cannot take a hodgepodge approach.

From the Center for Critical Thinking and Moral Critique of Sonoma State University in California, comes a more plausible approach to the teaching of critical thinking across the curriculum. Richard Paul, A.J.A. Binker, Douglas Martin, and Ken Adamson have written a handbook that shows how to redesign instruction in a manner that incorporates thirty-five critical thinking "strategies." [7]

(See Appendix F) The term "strategy" as used in this book is considered to be a skill or ability that encompasses a principle and an application. The strategies are categorized in three parts: A. Affective Strategies, B. Cognitive Strategies--Macro-Abilities, and C. Cognitive Strategies--Micro-Skills. All of these are higher order abilities with the word "reason" or "reasoning" appearing in three of them and relating to several more.

An example of an affective strategy would be "S-3 Exercising Fairmindedness." The principle is explained as considering the strengths and weaknesses of opposing points of view. As a suggested application, the teacher should "encourage students to show reciprocity when disputes arise or when the class is discussing issues, evaluating the reasoning of story characters, or discussing people from other cultures" (Paul et al. 1989, 60).

"S-24 Practicing Socratic Discussion: Clarifying and Questioning Beliefs, Theories, or Perspectives" is an example of a macro-ability strategy. The principle explains that critical thinkers are questioners as well as comfortable when they are questioned. "The ability to question and probe deeply, to get down to root ideas, to get beneath the mere appearance of things, is at the very heart of the activity" (Paul et al. 1989, 86). As one application of this strategy, the teacher should ask thought-provoking questions to begin a Socratic discussion, which would teach them to probe for and question assumptions, judgments, inferences, apparent contradictions, or inconsistencies (Paul et al. 1989, 87).

An example of a micro-skill is S-31 Distinguishing Relevant from Irrelevant Facts. According to the principle, attention is focused on relevant facts, and irrelevant considerations are not to affect conclusions. One of several methods of application would be to have students limit their remarks to facts which are germane to that issue, problem, or conclusion when participating in a discussion (Paul et al. 1989, 94).

Also included in the strategies are other philosophical ideas as well as the use of dialogue (Paul et al. 1989, 56). The handbook explains clearly the principle and application of each strategy as well as examples of remodeled lesson plans that utilize them (Paul et al. 1989, 57-97).

Paul's program, then, in comparison to Chance's, is logically conceived, connects the strategies in three understandable categories, and aims consistently at development of higher order thinking skills that relate to the elements of reasoning. The presentation of the strategies with clearly explained principles and applications contributes to a workable, sensible approach.

The across-the-curriculum program requires all teachers to be trained in strategies such as some of Professor Paul's. This is not a simple undertaking no matter how it is approached. According to the Sonoma handbook, it first requires an understanding of the concept of critical thinking, which was explained as disciplined, self-directed thinking which displays mastery of intellectual skills and abilities (Paul et al. 1989, 361). Next, this concept needs to be translated into principles which are then linked to applications, as we saw above. Finally, these strategies must be implemented in specific lesson plans (1989, 326). The handbook continues with an explanation of the necessary goals of teacher in-services: 1) Clarifying the global concept, 2) Understanding component teacher strategies, 3) Seeing a variety of ways in which the various component strategies can be used in classroom settings, 4) Getting experience in lesson plan critique, and 5) Getting experience in lesson plan remodelling (1989, 327-328).

Another, seemingly shorter approach to teacher training is the use of prepackaged finished lesson plans designed by someone else. If these are used, teachers will not develop their own critical thinking skills, insights, and motivations. Also, the implementation of this type of material is likely to be ineffective if the teacher lacks the basic understanding of the principles behind the lessons.

Another aspect of teacher training that needs to be examined is the reaction of the individual teacher and the need for commitment. Teachers who have been in the system for some time might be unwilling to try some of these new ideas. According to the Paul handbook:

It will not work for those who are deeply complacent or cynical, or for those who do not put a high value on students' learning to think for themselves. It will not work for those who are 'burned out' or have given up on change. Finally, it will not work for those who want a quick and easy solution based on recipes and formulas (Paul et al. 1989, 326).

The school district must also make a commitment, one that has a reasonable time limit, to this type of program. Changes would not come overnight. It is necessary to have a realistic trial period and then determine extensions as needed. Organization and cooperation on all levels would be required to create an effective program, and it would be of the utmost importance to have an implementation plan. If

such a program were followed in a practical and structured manner, it could prove to be quite successful.

C. Clark County School District

When Kulas and Laughlin completed the Teaching Strategies for Thinking manual for the Clark County School District, they must have felt that a great accomplishment was done. Borrowing ideas from all the great thinkers and educators, this inservice book contains a wealth of ideas and plans for teacher training.

However, the manual can best be described as a confused collection of skills and methods that relate to thinking. The initial problem comes when trying to understand the difference between "strategy" and "skill." In the beginning they can be interpreted as the "skill" being one of the sixteen listed, all of which require that the "strategy" (teaching method) be used to obtain them. But this makes no sense later on because most of the manual introduces various "strategies" to promote the use of thinking, and the majority of these have little or nothing to do with the earlier-mentioned skills. At best they can be seen to relate generally to the broader categories that are supposed to be the major components of the book.

This leads us to another problem. According to its aims, the manual was intended to promote critical thinking,

but somewhere along the way, this intention was discarded. Instead, a major component of the book is to promote recall, which has subcomponents of translation and memory. But these are well-known to be lower order thinking skills, proficiency in which is already strongly established by the NAEP studies of grades 3-11 and of young American adults. If the emphasis is supposed to be on teaching critical thinking, then only higher order skills should be included (perhaps with reference to how they build upon the lower skills).

Another overwhelming problem with this program is practicality. We observed earlier that twenty hours of inservice material was contained in the manual. But a typical school in the Clark County School District offers possibly one half day of inservice at the beginning of the school year (3 hours) and maybe one-half hour to one hour after classes during the course of the year (total of 4 hours). If three of these four hours each year were spent just on critical thinking, it would take almost seven years to complete the manual. Since this is highly unlikely, there are two other possibilities: 1) The principal decides that all of this is a waste of time and elects to do none of it; or 2) A decision is reached as to the most important lessons in the manual (perhaps up to 3 or 4 hours), and these are presented.

Let us now assume that option 2 was chosen. From all the previous studies done and commentary by the experts cited earlier, we have come to see that reasoning is probably the most important activity to be enhanced by critical thinking skills. Where is it discussed in the manual? There is no major section about reasoning. There is no specific inservice about reasoning. Maybe it is hidden in the list of sixteen skills. For example, under the heading of "understanding," we find "inferring and drawing conclusions." Of course, there is a problem here. Why are there two phrases for the same skill?

There is more! In the "pursuit" category, there are several: predicting outcomes, cause and effect, hypothesizing, assessing, justifying, and composing, all require reasoning, according to the elements cited in Chapter Two. Amazingly, half of the sixteen skills involve reasoning. How much time is devoted to this worthy training? Less than one minute. And, strangely, sharing that minute, are the skills of "sequencing," "remembering," and "observing,"--all lower order, relating to simple recall.

It is true that many of the in-service lessons do include skills relevant to reasoning. But these are not logically presented, and the overall effect is one of confusion. For example, an in-service about analogies is found in the section of "Strategies for Optimal Learning,"

along with a questioning strategy, an organizational strategy, and a memory stimulator.

It cannot be assumed that all teachers have knowledge of this manual and the information contained within it. Only a privileged few are aware that it exists, and only the extremely interested have bothered to investigate its contents. It should also not be assumed that the implementation of this program has taken place in the district schools because principals currently have total control over the selection and/or administration of the manual's in-services.

In conclusion, the Clark County School District's answer to critical thinking is a manual that is laced with redundancy, overlaps, and a general confusion of higher and lower order skills. There are no links between skills and no indication as to where they belong or what are their limits. District teachers who are exposed to the in-services in the manual will not be able to comprehend the concept of critical thinking and will not gain the needed control of the required skills to pass them along to students. Also, as it currently stands, there is no in-service commitment to guarantee motivated teachers the necessary training.

In all fairness, the five years of work and effort by so many deserves respect and credit. The developers are not to be faulted for the problems, especially considering

curricular aims and the educational background of those involved. This is a young area, and confusion is widespread. The CCSD has a beginning. It is like a truck unloading building materials on an empty lot. What is needed now is the plan, the design, for a transformation into a workable structure.

Endnotes/ Chapter 6

1. Lipman, Matthew. "Philosophy for Children: A Traditional Subject in a Novel Format." Thinking, The Journal of Philosophy for Children 7.4 (1988):S4.
2. It is current Clark County School District policy that certain topics are permitted to be discussed in certain classes only. For example, AIDS or birth control can only be taught or discussed by health or home economics teachers, and in those classes, the content of controversial topics is limited by school district dictates.
3. Gazzard, Ann. "Evidence of Effectiveness of the Philosophy for Children Program--Quantitative Studies--1987-1988." Thinking, The Journal of Philosophy for Children 7.4 (1988):S13-14.
4. Chance, Paul. Thinking in the Classroom: A Survey of Programs. New York: Teachers College Press, 1986. 56.
5. Lane, Neil R., and Jones, Susan A. "Rationality, Self-esteem and Autonomy through Collaborative Enquiry." Oxford Review of Education 12.3 (1986):43.
6. Meehan, Kenneth A. "Evaluation of a Philosophy for Children Project in Hawaii." Thinking, The Journal of Philosophy for Children 8.4 (1990):22.
7. Paul, Richard, Binker, A.J.A., Martin, Douglas, and Adamson, Ken. Critical Thinking Handbook: High School (A Guide for Redesigning Instruction). Rohnert Park: Center for Critical Thinking and Moral Critique, 1989. All further references to this work will appear parenthetically throughout the text with page numbers indicated as, for example, "(Paul et al. 1989, 56)."

IV. Conclusion

Chapter 7

The Philosophy for Children program appears to be the best option by which school districts could infuse a critical thinking program into their schools. By directly teaching students of all ages, there is a guaranteed exposure to the needed skills. Another advantage of this program would be that only a limited number of teachers would need the required training. This would be more realistic than training all teachers. The philosophical approach is perhaps the most desirable method of introducing the necessary skills. Another reason for promoting this program over others would be its focus on reasoning, which is the heart of higher thinking.

The problem that the Clark County School District faces is that it did not elect to use the above program. Instead, five years were spent developing a thoughtful thinking program which is inadequate and impractical. What course of action should Clark County take?

- 1) Funding needs to be provided so that critical thinking can again be stimulated. This funding should be utilized to reactivate the position of thinking skills consultant, to purchase necessary materials or programs, and to set-up in-services for district teachers.

The new position of thinking skills consultant needs to be a person who should hold an advanced degree in the area of critical thinking and should not have been involved in the previous program in the county. This person should act as a liaison between the school district and the university.

2) In order to be certified or recertified in the CCSD, a teacher must be required to take a course in critical thinking at an accredited university. It would also be wise to require new teachers to have courses in reasoning and critical thinking as undergraduates.

3) The legislature should be so convinced of the need for training in critical thinking, that it will mandate the instruction of these skills in the public schools.

4) More curricular changes need to be made. Currently all new and newly revised curriculum guides contain course goals involving the promotion of critical thinking skills. But these are too vague. If the current trend (of infusion of critical thinking across the curriculum) continues, then a more specific and coherent approach needs to be taken. Richard Paul's plan would be a vast improvement. This would entail a reduction in content in order to gain more depth of the material to occur. The Philosophy for Children program should not be ruled out. Used in conjunction with thoughtful teaching, it would be an outstanding way to insure the learning of higher order thinking.

5) In-services should be provided more often and should be restructured to be more beneficial. At least two full days of in-service training should be presented in this area during the school year. Teachers are not receptive to attending "quicky" in-services after a lengthy school day, and even a half day at the beginning of the school year is not enough. Material that is of this value deserves sufficient time. We cannot assume that teachers know how to think critically. How can they teach what they may not know? In-services, therefore, must be structured so that the teachers can experience the skills they are to carry back to the classroom.

In recent years, a two-Saturday professional growth course has been offered at the University of Nevada, Las Vegas, in reasoning across the curriculum. Taught by Professor Walton, the focus of this course was to introduce the elements of reasoning to district teachers and analyze current classroom materials in this respect. If all district teachers were required to take this course, or, better still, if Reasoning Across the Curriculum were presented in all area schools as a two day in-service, a strong foundation for critical thinking would be established.

6) There is some value to the lesson plans in the thinking skills manual. They have been tested in classrooms and found to be successful. Copies should be made of these

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plans, and they should be distributed to the teachers that can utilize them. None of these plans are harmful. However, the true direction to take would be to teach the faculty to remodel their own lesson plans to incorporate the needed skills. At present, the only reason for the utilization of these plans is to get some benefit out of the five years already spent on critical thinking in Clark County.

* * *

The evidence that shows American young people are functionally illiterate reaches from 1977 to 1990. The inability of Americans to reason well affects their productivity as well as their ability to be good citizens. Something must be done to remedy this situation.

There are successful approaches to teaching higher order thinking skills. The Clark County School District must take immediate action to set its program in a positive direction. If something is not done, the Southern Nevada area will continue to be part of the NAEP's negative assessment.

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Appendix A-F

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