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An analysis of critical thinking skills for students with learning disabilities in the fourth through sixth grades

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AN ANALYSIS OF CRITICAL THINKING SKILLS
FOR STUDENTS WITH LEARNING DISABILITIES
IN THE FOURTH THROUGH SIXTH GRADES

A Thesis
Presented to
The Faculty of the College of Education
San Jose State University

In Partial Fulfillment
of the Requirements for the Degree
Master of Arts

by
Ann Jackson Felton Griffin
May, 1995

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ABSTRACT

AN ANALYSIS OF CRITICAL THINKING SKILLS INSTRUCTION FOR STUDENTS WITH LEARNING DISABILITIES IN THE FOURTH THROUGH SIXTH GRADES

by Ann Jackson Felton Griffin

This thesis examines the importance of critical thinking skills instruction as it relates to students with learning disabilities. It focuses on the attitudes of Resource Specialists and Special Day Class teachers toward such instruction for students with learning disabilities in the fourth through sixth grades. In addition, methods, strategies, and materials that these teachers use to facilitate the development of their students' critical thinking skills are discussed. Research on this subject indicates that students with learning disabilities characteristically lack effective thinking skills strategies. These thinking skills strategies, that are necessary for critical thinking, can be taught. With appropriate instruction, students with learning disabilities can improve their cognitive functioning and increase their critical thinking skills. Teachers involved in this study corroborated the researcher's findings.

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CHAPTER I

INTRODUCTION

The world today is rapidly changing. Society faces political upheaval, economic instability, developing technology, and an "information explosion." The information explosion is by no means the least of these changes. The information available doubled every 10 years before 1970. Information now doubles approximately every 20 months (Beyer, 1987).

Educators increasingly recognize that they can no longer rely on past information and the knowledge that can be derived from it to prepare youth for today's changing world. Students must actively participate in thinking skills instruction in order to effectively deal with the changes they face (Beyer, 1987; Presseisen, 1986) because, as Robert Sternberg stated,

Bodies of knowledge are important, of course, but they often become outdated. Thinking skills never become outdated. To the contrary, they enable us to acquire knowledge and to reason with it regardless of the time or place or kinds of knowledge to which they're applied. (Quimby & Sternberg, 1985, p. 53)

Thinking skills can be categorized, according to B. Bloom (1956), as knowledge, comprehension, application, analysis, synthesis, and evaluation. Knowledge, comprehension, and application are considered lower-order

thinking skills, while analysis, synthesis, and evaluation are considered higher-order thinking skills (Kagan, 1986; Sadker & Sadker, 1986; Sanders, 1966). This hierarchical view of thinking skills can be misleading, however, as each of these skills can vary in difficulty from task to task. Activities requiring analysis can be complex or simple, depending on the elaborateness of the problem. Likewise, activities involving evaluation can also be complex or simple (Stiggins, Rubel, & Quellmalz, 1988).

Stiggins et al. (1988) described thinking skills in terms similar to those of Bloom. In their terminology, recall includes Bloom's recall and comprehension, analysis and comparison incorporate Bloom's analysis, and inference subsumes Bloom's application and synthesis. Evaluation is the same in both sets of terminology.

A comprehensive study of over 1,000 classrooms conducted by Goodlad (1984) revealed that, while statements of educational aims typically include terms such as critical thinking, problem-solving, and intellectual development, he seldom observed activities designed to bring these aims to realization in classrooms. While good teachers appear to encourage the use of thinking skills to realize these educational aims, few teachers actually teach students how to think. Thinking skills instruction involving higher-order thinking has often been reserved for classes of gifted or honors students. Thinking skills are essential in helping students to meet the demands of citizenship and

careers as well as to achieve their full potential as human beings. Instruction in these skills should not be denied to students on the basis of mental ability or proficiency level (Ruggiero, 1988). Research in cognitive processes indicates that even those thinking skills most closely associated with the gifted can be taught to almost anyone. Students in regular and remedial programs actually need thinking skills instruction more than do honors students.

Extensive research reveals deficiencies in the cognitive processes and strategies of students with learning disabilities. While differences within the various learning disabilities are observed, many similarities exist (Brown & Palinscar, 1982). Students with learning disabilities exhibit poor use of learning strategies, including a lack of attentional and mnemonic strategies (Brown, Campione, Bray, & Wilcox 1973; Brown & Palinscar, 1982; Butterfield, Wambold, & Belmont, 1973; Gresham & Reshly, 1986). Because students with learning disabilities demonstrate limited thinking skills, they often choose self-defeating classroom behaviors, such as impulsive response patterns and failure to attend to academic tasks.

Research indicates that students with learning disabilities can improve their thinking processes through the use of appropriate guidance and facilitation. Reid and Hresko (1981) reported that, while some researchers suggest that students with learning disabilities cannot benefit from a cognitive instructional approach, they do not learn in a

way that is fundamentally different from others. In other words, despite delays and less efficient learning behaviors, these children should still improve their skills through instruction.

Statement of the Problem

American educators agree that students should be taught critical thinking (higher-order) skills and that students with learning disabilities have greater needs in the area of thinking skills than do students without learning disabilities. Research indicates that students with learning disabilities can learn to think critically with instruction. However, because students with obvious learning disabilities exhibit deficient basic academic skills (reading, writing, and arithmetic), educators concentrate on remediating these basic skills and may not provide appropriate instruction designed to enhance critical thinking. Teachers of students with learning disabilities would find it helpful to have information with regard to what teaching techniques and strategies other teachers successfully implement to improve students' critical thinking skills.

Purpose of the Study

The purposes of this study are: (a) to describe learning disabilities and critical thinking; (b) to examine the implications of critical thinking skills instruction for students with learning disabilities; (c) to gather activities, methods, strategies, and materials that resource

specialists (RSPs) and special day class (SDC) teachers use to improve their students' critical thinking skills and; (d) to examine teacher attitudes toward critical thinking skills instruction as it relates to themselves and their students.

Research Questions

Research question 1. What are the characteristics of learning disability?

Research question 2. What is critical thinking?

Research question 3. How can critical thinking skills instruction benefit students with learning disabilities?

Research question 4. What programs have been implemented to improve the critical thinking skills of students with learning disabilities?

Research question 5. What activities, strategies, methods, and materials are teachers of students with learning disabilities in grades 4 through 6 using to foster critical thinking skills in their students?

Research question 6. What characteristics and circumstances do teachers view as facilitators of and obstacles to critical thinking?

Research question 7. What are the attitudes of teachers of students with learning disabilities in grades 4 through 6 toward involving their students in critical thinking skills instruction?

Assumptions

1. Most teachers of students with learning disabilities are interested in helping their students to think

critically.

2. Students with a variety of learning disabilities can learn to think critically with appropriate instruction.

Limitations and Delimitations

Participants in this study were largely a self-selected group. Educators who are interested in critical thinking skills instruction for students with learning disabilities in grades 4 through 6 were more likely to respond to and return the questionnaire.

Definition of Terms

Learning Disability. Reported by the National Joint Committee on Learning Disabilities (1981) as:

A general term that refers to a heterogeneous group of disorders manifested by significant difficulties in the acquisition and use of listening, speaking, reading, writing, reasoning, or mathematical abilities. These disorders are intrinsic to the individual, presumed to be due to central nervous system dysfunction, and may occur across the life span. Problems in self-regulatory behaviors, social perception, and social interaction may exist with learning disabilities but do not by themselves constitute a learning disability. Although learning disabilities may occur concomitantly with other handicapping conditions (for example, sensory impairment, mental retardation, serious emotional disturbance) or with extrinsic influences (such as cultural differences, insufficient

or inappropriate instruction), they are not the result of those conditions or influences (p. 1).

Analysis. Division of material into component elements. Analysis involves part/whole relationships and cause/effect relationships (Bloom, 1956; Stiggins et al., 1988).

Comparison. Recognition or explanation of similarities or differences. Comparison goes beyond breaking a whole into parts (Stiggins et al., 1988).

Synthesis. Includes both deductive and inductive reasoning and requires students to relate and integrate information (Bloom, 1956; Stiggins et al., 1988).

Inference. Essentially the same as synthesis (Stiggins et al., 1988).

Evaluation. Ability to judge credibility, practicality, quality, or worth (Bloom, 1956; Stiggins et al., 1988).

Impulsivity. A response to stimuli (including academic instruction) characterized by seizing the first response to come to mind, failure to pause and consider possible alternatives, and failure to reflect on consequences (Brown & Quay, 1977).

Critical thinking. Higher order thinking skills; analysis, synthesis, and evaluation (Bloom, 1956) or analysis, comparison, inference, and evaluation (Stiggins et al., 1988).

CHAPTER II

LITERATURE REVIEW

This study concerns the appropriateness of critical thinking skills instruction for fourth through sixth grade students with learning disabilities. This chapter describes research concerning learning disability, critical thinking, and the instructional strategies that have been successfully used to foster critical thinking skills in students with learning disabilities.

A search of literature was conducted, focusing on studies that have attempted to improve the critical thinking skills of students with learning disabilities. The results of this research are recorded under the following topic headings:

1. Learning disability
2. Critical thinking
3. Critical thinking skills instruction for students with learning disabilities
4. Programs for teaching critical thinking skills to students with learning disabilities
5. Summary

Learning Disability

The definition of learning disability has undergone many modifications since psychologists and educators first attempted to define the term. Numerous facets of the definition have been added and deleted over time. Two of

the most important modifications were the deletion of brain injury as the sole cause (Sarason, 1949) and the inclusion of discrepancy between aptitude and achievement as a criterion (Bateman, 1965). Kirk (1962) authored a definition that can be thought of as a foundation for more recent definitions (Hammill, 1990).

Kirk (1962) described learning disabilities as a delayed development or a retardation in one or more of the following processes: speech, language, reading, writing, arithmetic or other subjects. Kirk reported that this delay or retardation was the result of a psychological handicap which could be caused by cerebral dysfunction and/or emotional or behavioral disturbances. Kirk further reported that mental retardation, sensory deprivation, cultural, or instructional factors were not the cause of learning disabilities.

Bateman (1965) developed a new definition of learning disabilities in 1965. Although Bateman's definition was not widely accepted, it introduced the idea of a discrepancy between aptitude and achievement which has been generally accepted (Hammill, 1990). The idea of a discrepancy between aptitude and achievement helped to provide an educational focus (Kavale & Forness, 1992). Ultimately, it has served as a way of limiting those who may receive services provided to those who have learning disabilities. In recent years, the concept of discrepancy has been viewed with disfavor because of increasing skepticism toward the validity of intelligence tests. These tests contain cultural biases and

vocabulary that may be unfamiliar to students (Kavale & Forness, 1992).

In 1968, the National Advisory Committee on Handicapped Children (NACHC) issued a definition similar to Kirk's 1962 definition. Emotional disturbance was no longer listed as a cause of learning disabilities, the definition was limited to children, and thinking disorders were included as a learning disability. This definition was incorporated into Public Law 91-230, The Children with Specific Learning Disabilities Act (1969), and established learning disabilities as a category of special education (Kavale & Forness, 1992). The definition also served as a basis for the 1977 U.S. Office of Education (USOE) definition that was utilized in the writing of Public Law 94-142 (Hammill, 1990).

The National Joint Committee on Learning Disabilities (NJCLD), composed of representatives from eight organizations that have a major interest in learning disabilities, created a new definition in response to inherent weaknesses limiting the effectiveness of the definition used in PL 94-142 (Kavale & Forness, 1992). The NJCLD definition was proposed to clear up the discrepancies between the USOE definition and its accompanying operational criteria. The NJCLD definition differed in that it: (a) eliminated the insinuation that learning disabilities are only associated with children; (b) dropped the phrase "basic psychological processes"; (c) drew a distinction

between learning disabilities and learning problems; and (d) left open the possibility that learning disabilities could occur along with other handicapping conditions. The NJCLD representatives approved the new definition unanimously. After much debate, each of the member organizations accepted the definition with the exception of the Learning Disabilities Association of America (now the LDA, formerly the ACLD) (Hammill, 1990).

Hammill (1990) analyzed the elements that he believed described learning disabilities and compared the various definitions. He concluded that, despite the fact that the USOE definition is the definition that is integrated into Public Law 94-142, the NJCLD definition is the best current definition when evaluated on a checklist of the important necessary aspects of a definition for learning disabilities. Kavale and Forness (1992) reported that the Interagency Committee on Learning Disabilities (ICLD), organized by congressional action, recently modified the NJCLD definition. The ICLD definition includes deficient social skills as a primary characteristic of learning disabilities, and mentions attention deficit disorder as a condition that may occur with learning disabilities, but not as a cause. This latest definition appears to be the clearest and most comprehensive to date. However, several of the NJCLD member organizations reject this definition due to the inclusion of deficient social skills as a primary characteristic.

Critical Thinking

There are numerous definitions of critical thinking and descriptions of the thinking processes involved. These definitions range from an inclusion of a small portion of the higher-order thinking processes to an inclusion of the majority of the thinking processes and even the inclusion of praxis or resulting action based on critical thought. Representative descriptions were selected to focus on the various points of view.

Presseisen (1985, 1986) described thinking processes in a hierarchical manner as did Bloom (1956). Presseisen categorized the various kinds of thinking into four types of cognitive processes: essential, higher-order, metacognitive, and epistemic. The first two categories are of primary concern in describing the thinking processes considered necessary for critical thinking to take place. The third category becomes important when considering how to teach students to learn to think critically.

Essential cognitive processes consist of basic thinking skills upon which thought develops. Recall, recognition, comparison, classification, and inference are among the skills involved in the essential cognitive processes. Analogy, inductive and deductive reasoning, interpretation, and evaluation are also included among these skills. Many of the skills that Presseisen (1986) described as essential cognitive processes were described by Bloom (1956) and Stiggins, Rubel, and Quellmalz (1988) as the higher-order

thinking processes necessary for critical thought. In contrast, Presseisen (1986) reported that essential cognitive processing skills appear to be prerequisites to the higher-order cognitive processes.

Lists of higher-order thinking processes typically include problem-solving, decision making, critical thinking, and creative thinking. Pressiesen (1986) limited the concept of critical thinking to one small area within the confines of higher-order thinking processes. In doing so, she differed with educators who view critical thinking in a broader, more dynamic sense (Brookfield, 1987; Freire, 1970; Paul, 1984; Shor, 1987). Presseisen reported that problem-solving involves the use of basic thinking processes to confront and resolve a difficulty that is known or defined. Decision making requires using basic thinking processes to select the best response from among numerous options. Presseisen uses the term "critical thinking" to name the process that involves the use of basic thinking to examine arguments and produce insight into certain meanings and interpretations. Creative thinking involves the use of basic thinking processes to originate novel and aesthetic ideas or products that are related to precepts as well as concepts (Presseisen, 1986).

Torrance (1988) recorded the following research definition for creativity: "The process of sensing difficulties, problems, gaps in information, missing elements, something askew; making guesses and formulating

hypotheses about these deficiencies, evaluating and testing these guesses and hypotheses; possibly revising and retesting them; and finally communicating the results" (p. 47). Torrance's research definition described a natural process that allows creativity to be considered part of everyday living.

Thus, much of creative thinking may arise from critical thought. Freire (1970) and Shor (1987) proposed that creative thinking is an essential part of the critical thinking process. They advocated problem-posing education that empowers students to perceive critically the way they exist in the world. Problem-posing education is based on creativity and stimulates honest reflection and action upon reality or creative transformation.

According to Presseisen (1986), metacognitive processes are composed of learning to learn skills and involve recognizing one's own learning difficulties and monitoring one's own progress. Educators may find it necessary and helpful to teach some students metacognitive skills before addressing critical thinking skills.

In a comprehensive analysis of thinking skills, Beyer (1988) described thinking processes much the way Presseisen (1986) did, with critical thinking again occupying but a small portion of a thinking processes model. Beyer (1988) reported that critical thinking, a much abused term, means whatever users stipulate it to mean. He noted that, in some circles, critical thinking means the higher-order thinking

skills drawn from Bloom's taxonomy, while in other circles the term critical thinking is used to include all thinking operations from recall to analysis to decision making.

Beyer (1987) stated that critical thinking is none of these. He reported that experts in critical thinking contend that it consists of "judging the authenticity, worth, or accuracy of something" (p. 61). In reality, some experts limit their view of critical thinking to this or similar descriptions and others do not.

The models of thinking processes designed by Beyer (1988) and Presseisen (1986) are similar, particularly with regard to critical thinking. They do differ, however, in their consideration of the problem-solving and decision making processes. Where Presseisen places them on the same level with critical thinking, Beyer places them on a level above critical thinking.

Ennis (as cited in King, 1988) provided a similar definition of critical thinking. According to Ennis, critical thinking is "the correct assessment of statements" (King, p. 14). To this definition, Ennis added 12 important aspects, such as recognizing ambiguity, identifying contradictions, and verifying the soundness of conclusions. Ennis believed that these aspects formed a basis for judging the rationality of statements.

Brookfield's (1987) description of critical thinking involved creative thinking, as described by Torrance (1988), and may lead to a different understanding of what critical

thinking is. Brookfield (1987) reported that critical thinking is composed of the following components:

1. Identifying and challenging assumptions,
2. Challenging the importance of context,
3. Trying to imagine and explore alternatives, and
4. Reflective skepticism.

Brookfield contended that critical thinking involves more than logical reasoning or analyzing arguments for unsupported assertions. Critical thinking involves recognizing the conjectures upon which beliefs and behaviors are based, being able to substantiate ideas and actions, and being able to judge the rationality of justifications. Critical thinkers can test the accuracy and rationality of justifications against an objective analysis of the world as they understand it. Brookfield (1987) noted that critical thinking is not passive but includes "a praxis of alternating analysis and action" (p. 23). When a problem arises, critical thinkers become aware of an assumption, question a given, or perceive a discrepancy. They analyze and act upon intuitions. Intuitions become modified, confirmed or refuted through action and are then refined and acted upon, further refined and acted upon. Thus, critical thinking is seen to be dynamic in nature, having a reflective dimension which leads to a change of perspective and perhaps even change outside of the thinker, as the thinker acts to change the conditions in which he or she lives.

Freire (1970), Paul (1984), and Shor (1987) viewed critical thinking as emancipatory in nature. In Freire's view, critical thinking begins with the perception of basic causes of one's place in society--the historical, cultural, socio-economic, and political context of personal lives. This critical thinking continues toward decisions and actions that people make to shape and control their own lives (Ahlquist, 1990).

Paul (1984) divided critical thinking into two categories: weak sense and strong sense. Weak sense critical thinking is limited to such tasks as mathematical logic, inductive and deductive reasoning, and the higher-order skills of Bloom's taxonomy. Strong sense critical thinking involves a real world approach, bringing contesting points of view into conflict and involving not only discussion and analysis, but resultant action. This resultant action empowers people to transform the reality of their lives (King, 1988).

Perhaps the conflict that arises out of trying to define critical thinking can be accounted for by semantics. While "critical" may mean discerning, diagnostic, or fault finding, it may also mean crucial or all important. Those who view critical thinking in strictly evaluative terms apparently adhere to the first definition. Those who view critical thinking in a broad or strong sense appear to accept both definitions. In the strong sense, evaluative thinking is only the beginning. The action that follows is

an essential or crucial element that enables men and women to improve the conditions of their lives. If one views critical thinking as an evaluative process only, it is an important skill for students to learn in order that they might evaluate effectively what they will believe. If one views critical thinking as emancipatory, it is crucial for students to learn in order that they might effect positive changes which will benefit them and the society in which they live.

Critical Thinking Skills Instruction for Students with Learning Disabilities

Students with learning disabilities have been identified as exhibiting numerous deficiencies in cognitive processes and strategies that inhibit academic progress and may adversely affect social functioning. Researchers report that students with learning disabilities often lack selective attention skills. That is, they may fail to attend adequately to relevant stimuli (Hallahan, Gajar, Cohen, & Tarver, 1978; Hallahan, Tarver, Kauffman, & Graybeal, 1978). Douglas and Peters (1979) noted that students who lack selective attention skills may develop limited response repertoires that may inhibit later learning. With limited response repertoires, students may become impulsive in their responses to both academic and social problems.

Some researchers (Barkley, 1981; Holborow & Berry, 1986) found that students with learning disabilities exhibit

higher rates of impulsivity, attention deficits, and hyperactive behavior than do students without learning disabilities. Students who display impulsivity speak out before considering their thoughts and hurry through assignments without checking their answers. They come to decisions too quickly (Lerner, 1985). According to Torgeson (1980, 1982), students with learning disabilities display impulsive behavior because they lack alternative cognitive strategies. Others have argued that impulsivity may also be a reasonable response to a condition such as inadequate instruction (Laing, 1967). Lerner (1985) noted that the obvious solution to impulsivity is to help students acquire helpful cognitive learning strategies. But educators must also evaluate the learning environment they are providing. Laing (1967) wrote:

Any technique concerned with the other without the self, with behavior to the exclusion of experience, with relationship to the neglect of the persons in relation, with the individuals to the exclusion of their relationship, and most of all, with an object to be changed rather than a person to be accepted, simply perpetuates the disease it purports to cure. (p. 32)

Torgeson (1982) described students with learning disabilities as passive and dependent learners. Students may believe that they cannot learn because of past experiences with frustration and failure.

Students with learning disabilities are also deficient in the metacognitive or learning to learn skills which involve checking, monitoring, and planning (Torgeson, 1977). They may not know how to direct and control their own thinking, how to go about gaining knowledge, or how to use mnemonic strategies (Lerner, 1985; Meichenbaum, 1977; Torgeson, 1982; Wong & Jones, 1982). Certain metacognitive deficits are said to be related to specific academic tasks. Students with learning disabilities who are poor readers exhibit less awareness of the purpose of reading than do those without learning disabilities. They also display less awareness of strategies for decoding, comprehending, and reading for a purpose (Kurtz & Borkowski, 1984; Wong & Jones, 1982). Students with learning disabilities who are poor spellers have difficulty monitoring errors, generating effective spelling strategies, and searching for and retrieving information relevant to spelling (Gerber & Hall, 1987; Graham & Freeman, 1986; Wong, 1986). Students with learning disabilities who have difficulty with mathematics experience problems selecting and applying algorithms, and using effective debugging and monitoring procedures. (DeCorte & Verschaffel, 1981).

Meichenbaum (1977) found that the inappropriate behaviors and maladaptive performance of students with learning disabilities result primarily because the cognitive strategies these students use are poorly organized (Brown & Alford, 1984). Indeed, deficiencies in thinking and

reasoning have been included in definitions of learning disabilities (Hammill, 1990). But, while students with learning disabilities may have much to overcome, they have been shown to benefit from thinking skills instruction, including that of critical thinking. Ruggiero (1988) reported that, while critical and creative thought were previously associated with gifted or genius intelligence levels, they can be the result of ordinary thought processes of individuals with ordinary intelligence. Ruggiero (1988) indicated that the thinking skills researchers associate with critical and creative thought can be taught to anyone.

Programs for Teaching Critical Thinking

Many educators have designed programs in an effort to improve the thinking skills of students with learning disabilities. Valett (1986) described five important programs organized to benefit students with deficient cognitive processing. Some of the programs were developed for students who were believed to have mental retardation, but educators have since used these programs to benefit students with learning disabilities.

French physician and otologist Jean Itard created a thinking skills program in 1795. He designed the program for a ten-year-old "wild-boy" who had been found in a French forest. Itard developed a prescriptive teaching method designed to develop the boy's mental operations. The instruction lasted for five years. Itard (1962) was frustrated by the slow rate of progress but did report

specific gains. Itard recorded his work with the boy in his diary, "The Wild Boy of Aveyron."

Maria Montessori (1964) developed her instructional program for use with young retarded and disadvantaged children based on Itard's work. Montessori, like Itard, recorded her methods. She described concrete materials which she constructed and used to teach numerous skills, including seriation and classification. Montessori's methods have been used successfully with students who exhibit learning disabilities.

In a program entitled The Milwaukee Project, special educators focused on the development of vocabulary, comprehension, prediction, critical thinking and concept evaluation, organization, and reasoning for 40 children who had mothers with mental retardation. The training took place between the ages of three months and six years. Significant gains in ability and academic achievement were reported in contrast with control groups. Gains held throughout the primary years (Heber, Garber, Harrington, Hoffman, & Falender, 1972).

The Glendora Unified School District (1977) involved students with learning disabilities and students with mental retardation in a program based on Guilford's Structure of Intellect Model (Guilford, 1967). The program addressed semantic and figural and symbolic problems as well as memory, evaluation, and convergent and divergent thought production. The program included units on: (a) study of

feelings, (b) interpersonal relationships, (c) necessary steps toward meeting goals, (d) predicting consequences of actions, and (e) applying a problem-solving model. The program was monitored and evaluated for three years. An outside evaluator analyzed pretest and posttest scores. The evaluator reported significant gains in criterion test scores. Objectives in five areas were met by both regular education students and students with learning disabilities. Many students with learning disabilities displayed such improvement in cognitive skills that IEP teams returned them to regular classrooms (Glendora Unified School District, 1977; Valett, 1986).

Feuerstein (1980) developed a program called Instrumental Enrichment that was designed to develop the cognitive abilities of slow learners, disadvantaged learners, and students with mental retardation at the intermediate level. Students learn organizational skills that are generalizable to academic learning. Studies indicate that students involved in this training perform significantly better on academic tasks. Researchers have successfully used this program to improve the problem solving skills of students with learning disabilities (Arbitman-Smith & Haywood, 1980; Chance, 1981; Messerer, Hunt, Meyers, & Lerner, 1984).

Groshong (1988) developed a program designed to facilitate group participation and to provide direct instruction in critical thinking and independent learning to

students with learning disabilities. Groshong organized a series of Great Books discussions. The program involved one group of fifth grade students who did not have learning disabilities and one group of students who received resource room reading services or Chapter I services. Groshong conducted the program for eight weeks and gathered data from observations of group discussions, observations of Great Books discussions, and tape recordings of Great Books groups. She made observations both before and after the Great Books discussion series was implemented. Groshong's observations revealed that students who were receiving special services were more often actively off task and used "put downs" more frequently than did the other students. They were also dismissed from the group due to disruptive behavior more than were the other students.

Listening, taking turns, and using the words, "I think...because..." to express supported opinions were introduced during the first discussion as a magic formula for good discussions. The regular group was able to incorporate these skills quickly. Groshong (1988) found it necessary to use a behavior management program with the special students in order to help them control their behavior and implement the three discussion skills. Analysis of the taped discussions indicated that the length of responses greatly increased for both groups, as students learned to integrate story facts with opinions. Groshong concluded that students with learning disabilities and other

students with special needs do benefit from direct instruction in listening skills, group interaction skills, and critical thinking skills.

In a similar study, Commeyras, Pearson, Ennis, Garcia, and Anderson (1992) pretested and posttested the critical thinking skills of 14 students with learning disabilities. They then involved 7 of them in a program of 10 Dialogical-Thinking, Reading Lessons (D-TRLs) proposed to help students develop critical thinking skills. The lessons were conducted during a two-month period and lasted from 30 to 40 minutes. In addition to the pretest and posttest scores, the researchers utilized audio and video tape recordings to assess student progress. While implementing this program, they hoped to increase the students' disposition to seek reasons and clarification, to increase their ability to provide clarification to others, and to increase the use of critical thinking terminology.

Posttest scores did not indicate that students had benefited from the lessons. Only one student raised his score significantly. However, when Commeyras et al. (1992) gave students their completed posttests without marks to indicate correct or incorrect responses and asked them to explain their answers, they were able to justify their incorrect answers. Students justified their responses by indicating that their interpretation differed from that intended by the test writers. The researchers concluded that the test underestimated the complexity of the students'

critical thinking abilities. Transcripts of the tapes indicated that Dialogical-Thinking, Reading Lessons did promote critical thinking skills in students with learning disabilities.

Summary

A variety of views of what critical thinking entails exists. In its most dynamic sense, critical thinking goes far beyond analysis, judgment, decision-making, and problem-solving. In this sense, critical thinking arises out of a need for change in circumstance and requires change not only in ideas and beliefs, but also in actions. Critical thinking requires a praxis of alternating reflection and action. Critical thinking is a means by which people can shape for the better their lives and the society in which they live.

The critical thinking skills of students with learning disabilities have long been an important concern of special educators. Researchers report that students with learning disabilities may display many difficulties in thinking processes (impulsivity, lack of selective attention skills, and poor metacognitive skills). Indeed, the most recent definition of learning disabilities includes reasoning in a list of possible significant difficulties. Critical thinking skills instruction can be of benefit to students with learning disabilities who may experience difficulty making important decisions and carrying out sound actions. Critical and creative thought are not exclusive to gifted

and genius levels of intelligence and corresponding academic functioning, but can be facilitated in almost everyone, including those with learning disabilities. That all capable students, including those with learning disabilities, become efficient critical thinkers should be a goal of educators today.

CHAPTER III

METHODOLOGY

Overview

Chapter III will describe research methods used to establish a base of information regarding activities, strategies, methods, and materials that RSP and SDC teachers working with fourth through sixth grade students with learning disabilities use to foster the development of critical thinking skills. This chapter will also describe research methods used to establish a base of information regarding teacher attitudes toward critical thinking skills instruction for fourth through sixth grade students with learning disabilities.

A survey procedure utilizing a teacher-prepared questionnaire was used to garner information from resource specialists and special day class teachers in California (see Appendix A). The questionnaire was field-tested by teachers not involved in the research and was checked for clarity, and content validity. Reliability was not measured. The questionnaire and an attached cover letter were approved by the San Jose State University Human Subjects Committee. The researcher tallied, tabulated and analyzed raw data that were collected from the returned questionnaires. The sections that follow detail research design, population sample, data collection procedures and data analysis.

Phase 1. Learning Disabilities and Critical Thinking

Research Questions

Four research questions concerning the implications of critical thinking skills instruction for students with learning disabilities were examined during a literature search: (a) What are the characteristics of learning disability? (b) What is critical thinking? (c) How can critical thinking skills instruction benefit students with learning disabilities? (d) What programs have been implemented to improve the critical thinking skills of students with learning disabilities?

Research Method

The researcher utilized historical and descriptive methods of research as described by Charles (1988) for the initial part of this study. Both primary and secondary sources were incorporated to trace chronologically and to describe definitions of learning disability, and programs that have been used to improve the critical thinking skills of students with learning disabilities. Definitions of critical thinking were grouped and discussed according to the various philosophies.

Data Evaluation

The data were evaluated by an informal cross-checking of sources. This process was completed in order to eliminate the possibility of inaccuracy. Differing opinions were noted and recorded.

Phase 2. Teacher Assessment of Critical Thinking Skills Instruction

Research Questions

Three research questions guided the development of the questionnaire forming the basis for the second part of this study: (a) What activities, strategies, methods, and materials are teachers of students with learning disabilities in grades 4 through 6 using to foster critical thinking skills in their students? (b) What characteristics and circumstances do teachers view as facilitators of and obstacles to critical thinking? (c) What are the attitudes of teachers of students with learning disabilities in grades 4 through 6 toward involving their students in critical thinking skills instruction?

Research Method

The second part of this study focused on critical thinking skills instruction provided to fourth through sixth grade students with learning disabilities in California and on teacher attitudes toward such instruction. A descriptive research approach as described by Charles (1988) was utilized, based on a questionnaire designed by the researcher.

Research Design: Survey

This descriptive study involved the use of a questionnaire designed by the researcher (see Appendix A). The questionnaire included the following sections: Personal Information, Student Information, Critical Thinking

Instruction, and Teacher Attitude Scale. The Personal Information section involved forced-answer questions regarding age, gender, ethnicity, socio-economic status, teaching experience, level of education, and credentials held. The Student Information section included fill-in (open-ended) questions regarding number of students, ages of students, gender of students, ethnicity of students, and estimated socio-economic status of students. The Critical Thinking Skills Instruction section involved questions regarding frequency of critical thinking skills instruction, obstacles to such instruction, activities, programs and/or handbooks used to foster critical thinking skills, and implications of students who possess well developed critical thinking skills.

The section entitled Teacher Attitude Scale required the subjects to respond by circling one of the following: 5-strongly agree, 4-agree, 3-unsure, 2-disagree, and 1-strongly disagree. Statements to which the subjects responded were arranged so that high scores on odd numbered statements indicated interest and/or favorable attitudes toward teaching critical thinking skills to students with learning disabilities, while low scores on even numbered statements indicated the same. In contrast, high scores on even numbered statements revealed indifferent and/or unfavorable attitudes toward teaching critical thinking skills to students with learning disabilities, while low scores on odd numbered statements indicated the same.

The Teacher Attitude Scale was designed in this manner in order to avoid the appearance of obvious bias on the part of the researcher.

Population

The population for this study consisted of 650 randomly selected RSP teachers and SDC teachers who met the population criteria. The population represented a range of community sizes. Teachers in small communities received questionnaires as did those in medium-large suburban communities and large urban communities. A teacher had to meet the following criteria to be included in the survey portion of this study:

Criterion 1 - the teacher must currently hold a resource specialist or special day class teaching position in California.

Criterion 2 - the teacher must work with students with learning disabilities in grades 4 through 6.

Sample

Since the researcher received only 6% of the distributed questionnaires, the sample was not a representative one. The researcher considered all completed and returned questionnaires. While some questionnaires were returned by school district office personnel, most were returned by teachers. Therefore, the sample was largely self-selected. The sample for this study consisted of 27 resource specialists and 13 special day class teachers. The Personal Information and Student Information sections of the

questionnaire supplied detailed information concerning this sample.

Three participants reported their ages as 26–30 years. Seven respondents reported their ages as 31–35 years. Eleven respondents reported their ages as 36–40. Nine participants noted that they were between the ages of 41 and 45 and ten respondents indicated that they were 46 years or older.

Twenty-eight percent of the respondents noted that they had no more than 5 years of teaching experience. Fifteen percent of the respondents reported that they had 6–10 years of teaching experience. Twenty percent of the respondents indicated that they had taught 11–15 years. Twenty percent reported teaching for 16–20 years and thirteen percent reported teaching for 21 years or longer.

Twenty-four respondents, or 60% of the sample, reported that they held a master's degree. Eleven, or 30%, indicated that they had accrued units beyond a bachelor's degree and four, or 10% reported holding a bachelor's degree.

Thirty-three participants in the study indicated that they were female, six participants reported that they were male, and one participant failed to respond to that question. Teachers involved in the study reported that, as a group, they worked with 857 students, approximately 70% of whom were male and 30% of whom were female (the exact percentages are not known as two teachers failed to indicate the number of male and female students taught).

Data Collection

The data were gathered using the teacher-designed questionnaire. The researcher included a cover letter that explained the questionnaire and defined critical thinking. The California Public School Directory, published by the Bureau of Publications, State Department of Education provided addresses and phone numbers of school districts in the state of California. Special Education and/or Special Projects Directors were contacted by mail. They were asked to distribute the questionnaires to RSP teachers and SDC teachers currently working with fourth through sixth grade students with learning disabilities. Directors were asked to collect the questionnaires prior to the end of their next special education meeting if a meeting was scheduled prior to the deadline for returning the questionnaire. Directors were asked to collect the questionnaires through intradistrict mail if no meetings were scheduled. The directors were asked to return them in self-addressed, stamped envelopes that were provided.

The questionnaires were distributed through the mail to Special Education and/or Special Projects Directors the second week of March, 1993. The directors were asked to collect and return the questionnaires by May 15, 1993. Only 15 questionnaires were returned by the deadline. Two more questionnaires were returned in June, 1993. Additional questionnaires were mailed for distribution during the second week of October. Twenty-three questionnaires were

then completed and returned. A total of 40 questionnaires was returned.

Data Analysis

Responses to the Personal Information and Student Information sections were tallied and percentages were calculated. These sections were included to gather information about the sample and to provide categories for comparison. Due to the small sample size, valid statistical comparisons could not be made. Responses to the Critical Thinking Instruction section were tallied, categorized, and described qualitatively. Responses to the Teacher Attitude Scale were tallied and tabulated and percentages were calculated. Data gathered from the Teacher Attitude Scale were also analyzed in terms of total points or scores and average points or scores assigned by the respondents to each statement. Analysis of the survey results is presented both narratively and graphically in Chapter IV.

CHAPTER IV

RESULTS AND DISCUSSION

Results

Survey results are recorded in the order that they appear on the questionnaire. The Critical Thinking Instruction section is presented narratively and the Teacher Attitude Scale is presented both narratively and graphically.

Critical Thinking Instruction

An analysis of the Critical Thinking Instruction section of the questionnaire yielded an abundant supply of information with regard to activities, strategies, techniques, and materials that teachers of students with learning disabilities use to encourage the development of their students' critical thinking skills. Responses to this section also supplied comprehensive information concerning obstacles to critical thinking and factors contributing to strong critical thinking.

Activities. Most of the teachers who responded to the questionnaire reported that they incorporate critical thinking skills instruction into their language arts and mathematics programs. Others indicated that they integrate critical thinking skills instruction into their social studies and science programs. One teacher responded, "I try to integrate critical thinking skills into all areas."

In an effort to facilitate critical thinking in

association with language arts, teachers reported involving students in group discussions based on literature and poetry. In these discussions, students are encouraged to express likes and dislikes as well as suggestions for changes. Students are also encouraged to offer solutions to story outcomes. Six teachers noted that they design literature projects and imaginative units that require students to use analysis, synthesis, comparison, and evaluation and to explore cause and effect relationships. Eight teachers reported that they involve students in numerous written language activities designed to encourage the development of critical thinking skills. Teachers offer students opportunities to analyze characters in a written format, respond to literature, and write compositions requiring problem-solving and support of opinions. Additionally, teachers reported using interactive journal writing as a means to increase critical thinking skills. Students offer opinions, reflect, and problem-solve within the context of their journals.

Thirteen RSP teachers and SDC teachers related that they incorporate critical thinking skills into mathematics by engaging students in programs that utilize manipulatives. These programs lead to the discovery of concepts. Also, alternate ways to solve problems are explored. One resource specialist noted, "I find it easy to use critical thinking in the area of math. I use hands on, life-related projects." Another reported, "I use activities to extend

math to home situations."

In order to integrate critical thinking skills instruction into social studies curriculum, seven teachers reported leading students in discussions on historical topics, current events, and newspaper articles. Teachers also reported having students observe television interviews and listen to radio shows, as well as create their own programs. Teachers involve students in social skills training, during which they participate in class meetings, brainstorming sessions, role playing, situational skits, and mock trials. These activities can foster the improvement of problem-solving skills, increase open-mindedness, and promote creativity as well as good citizenship.

Five teachers reported that they engage their students with learning disabilities in science activities designed to encourage prediction, discovery, and conclusion. Hands on activities are provided as they maximize student interest and lend themselves to higher-order thought. A special day class teacher reported, "I've created comprehensive units, starting from the Big Bang Theory to the solar system, earth formation to man, short history of man to present with a look at continents to neighborhoods."

Finally, one teacher noted that she has RSP students write a school magazine or newspaper. Students include reports, stories, columns (Dear Abby, sports, and editorials), interviews, and school events. Students publish and distribute the magazine. This activity provides

an excellent opportunity for students to develop a variety of critical thinking skills.

Programs, techniques, and materials. Eleven teachers indicated that they use cooperative learning techniques and questioning strategies. Four teachers include logic materials with lessons involving such skills as inductive and deductive reasoning in their programs. RSP teachers and SDC teachers who participated in the study shared the names of numerous programs and materials they use to facilitate the development of their students' critical thinking skills. Names of the authors and/or publishers of these programs have been included as provided by survey participants (see Appendix C). The extent to which teachers involved in the survey incorporate critical thinking skills instruction into their programs varies from "not often" to the "entire curriculum."

Obstacles. RSP teachers and SDC teachers who responded to the questionnaire provided a long list of obstacles to the development of critical thinking skills. Many of the obstacles they identified have been noted in the research of learning disabilities. Teachers related that lack of ability to concentrate, impulsivity (lack of understanding of think time), inactive learning style (relying on others to do the thinking), and poor metacognitive skills were all obstacles to their students' gaining critical thinking skills. A resource specialist reported, "I think one obstacle is that LD students tend to answer questions very

impulsively without using critical thinking skills available to them." She added, "They need to be given lots of opportunities to speak and need to be encouraged to wait before answering questions." Poor memory skills, inefficient perceptual skills, and processing difficulties were all described as obstacles, also. Additionally, teachers suggested that a lack of basic skills to build on, a limited knowledge base, lack of experiences, and limited language development also prove to be obstacles to critical thinking. Family situations and emotional burdens were mentioned as were poor social skills and hostility toward peers. Finally, some teachers pointed out that poor teaching methods, such as excess emphasis on rote drill and practice and fact regurgitation, interfered with students' critical thinking skills. One teacher noted that "lack of materials to use in class and lack of a strategy" were obstacles to his students increasing their critical thinking skills. Another admitted, "I don't take the time to formally plan to include critical thinking skills per se."

Strengths. Teachers involved in the study also shared their opinions as to what factors and/or characteristics caused certain students to become strong critical thinkers. Innate abilities, personality traits, and learning styles as well as home environment and prior instruction were the most commonly named causes. Teachers reported that their students who are strong critical thinkers characteristically have high self-esteem, and are willing to take risks and

accept challenges. Teachers further described these students as open-minded, self-motivated, persistent, able to focus attention, and not easily frustrated. Many teachers reported that these students have high intelligence, but one cautioned that students who are not exceptionally bright can learn these skills. Another reported, "All are capable of increasing their critical thinking skills beyond their current levels." Research supports this conclusion (Arbitman-Smith & Haywood, 1980; Chance, 1981; Messerer, Hunt, Meyers, & Lerner, 1984).

Teachers also reported that students with strong critical thinking skills have had more life experiences and possess a better knowledge base than do their peers. Many teachers noted that students with strong critical thinking skills have high receptive and expressive language skills. They may demonstrate a strong desire to verbalize and seem to thrive on opportunities to express their opinions.

Additionally, teachers noted that a rich home environment with strong family support positively influences critical thinking skills. They indicated that students with strong critical thinking skills have parents who have high expectations and involve them in many life experiences. These parents extend conversation to their children and encourage freedom of thought and expression.

Teachers reported that prior educational experiences had been important in the development of some students' strong critical thinking skills. They noted that good

teacher/student relationships had existed and further noted that students were in a learning environment in which they were encouraged to think and ask questions of adults. Teachers reported that students with strong critical thinking skills had previously had teachers who modeled and encouraged critical thinking skills. A teacher concluded her remarks on students with strong critical thinking skills in this way: "Learning environment has been increased through rich learning environment at home, [in the] community, and [at] school."

Teacher Attitude Scale

Table I indicates the number of teachers who selected each of the five possible responses for statements 1-10 on the Teacher Attitude Scale. The term "mixed response" refers to the selection of two or more answers for one statement. Questionnaires that revealed contradictory responses were carefully scrutinized for other inconsistencies. None were found.

Table 1

Number of Teacher Responses to Statements on the Teacher Attitude Scale

Statement number	Responses					
	Strongly agree	Agree	Unsure	Disagree	Strongly disagree	Mixed/no response
1	27	12			1	
2		2		15	21	2
3	18	17	2	1	1	1
4	1	1		14	24	
5	28	9			2	1
6				15	25	
7	10	13	5	7	5	
8		10	4	19	6	1
9	19	19				2
10		7	12	12	6	3

Statement 1. "Critical thinking (CT) skills can be taught to most students, including those with learning disabilities." All subjects provided a response to this statement. A total of 185 points were calculated. The average number of points per respondent for statement 1 was 4.6. Analysis of the responses revealed that nearly ninety-eight percent of the teachers surveyed agreed with this statement. One subject selected 1-strongly disagree,

indicating that she did not feel that critical thinking skills could be taught to most students, including those with learning disabilities. However, the same subject indicated that she believed to the contrary in other responses to the questionnaire. For a detailed comparison of teacher responses to statement 1, refer to Figure 1.

Figure 1. Comparison of percentages of teacher responses to statement 1 of the Teacher Attitude Scale.

Statement 2. "I don't have time to teach CT skills." Thirty-eight of the forty participants in the survey responded to statement 2. The total score calculated for this statement was 59 points with an average of 1.6 points per respondent. Only two teachers involved in the survey indicated agreement with this statement. Both teachers also indicated agreement with statement 3, a converse statement

to statement 2. Other responses on these teachers' questionnaires suggested that they do make time for critical thinking skills instruction. Figure 2 details teacher responses to statement 2.

Figure 2. Comparison of percentages of teacher responses to statement 2 of the Teacher Attitude Scale. Mixed or no response = 5.0% .

Statement 3. "I could or do make time to teach Critical thinking skills." Thirty-nine of the forty subjects involved in the survey provided a response to statement 3. A score of 167 points was computed for this statement. The average number of points per respondent for statement 3 was 4.2. Eighty-eight percent of the RSP and SDC teachers who completed the questionnaire reportedly agree or strongly agree with statement 3. Two subjects selected responses

that indicated disagreement. Both subjects suggested that they do provide critical thinking skills instruction in response to other questions on the questionnaire. Refer to Figure 3 for further comparison of responses to statement 3.

Figure 3. Comparison of percentages of teacher responses to statement 3 of the Teacher Attitude Scale. Mixed or no response = 2.5% .

Statement 4. "Introducing CT skills instruction into my program will make my job more difficult in the long run." All 40 respondents to the questionnaire selected responses to statement 4. The total score calculated for this statement was 61. The average number of points per respondent was 1.5. Only 5% of respondents registered agreement with statement 4. This percentage coincides with the 95% agreement response to the converse statement 9. One

subject selected 4-agree for both statements, revealing a contradictory response. For a detailed comparison of teacher responses to statement 4, refer to Figure 4).

Figure 4. Comparison of percentages of teacher responses to statement 4 of the Teacher Attitude Scale.

Statement 5. "CT Skills instruction is as important for my students as instruction in basic skills." All teachers surveyed responded to statement 5. A score of 178 points was calculated for statement 5 with an average of 4.6 points per respondent. One special day class teacher provided a mixed response of 5-strongly agree, 4-agree, and 3-unsure. She added "[It] depends on the student." According to the responses to the questionnaire, more than 9/10 of the teachers surveyed agree with statement 5. One teacher noted that "Critical thinking skills are crucial!" However, 1/4

of the teachers who participated in the study reportedly agree with the contrasting statement 8 (refer to Figure 5).

Figure 5. Comparison of percentages of teacher responses to statement 5 of the Teacher Attitude Scale. Mixed or no response = 2.5% .

Statement 6. "My students have adequate CT skills and do not need CT skills instruction." All participants responded to this statement. The total number of points computed for statement 6 were 55. The average number of points per respondent was 1.3. This statement received the most consistent set of responses. All teachers involved in the study reported disagreement with the statement. One resource specialist commented that "My student population currently contains many bright children whose thinking skills are well developed in some areas." However, even

this teacher indicated disagreement with statement 6 (refer to Figure 6).

Figure 6. Comparison of percentages of teacher responses to statement 6 of the Teacher Attitude Scale.

Statement 7. "My students have greater needs in the area of CT skills than do students without learning disabilities." All subjects responded to this statement. The total number of points for statement 7 was 136 with an average of 3.4 points per respondent. This statement was the most controversial statement on the Teacher Attitude Scale. While research (Barkley, 1981; Holborow & Berry, 1986; Lerner, 1985) suggests that students with learning disabilities often exhibit inefficient learning styles, that may impede the development of critical thinking, only 58% of those surveyed indicated agreement. Figure 7 illustrates

the bimodal distribution of responses to statement 7, indicating strong differences of opinion.

Figure 7. Comparison of percentages of teacher responses to statement 7 of the Teacher Attitude Scale.

Statement 8. "The most important things I teach my students are basic skills (reading, writing, and arithmetic)." Thirty-nine of the forty teachers surveyed selected responses to statement 8. The resource specialist who did not select a given response recorded, "need both" in response to this statement. A total of 96 points were computed for statement 8. The average number of points per respondent was 2.5. While the most often selected response was 2-disagree, the second most often selected response was 4-agree. This result was unexpected and was unusual compared to the other results. For a graphic illustration

of these results, refer to Figure 8.

Figure 8. Comparison of percentages of teacher responses to statement 8 of the Teacher Attitude Scale. Mixed or no response = 2.5% .

Statement 9. "Introducing CT skills into my program can help students minimize problems, making my job easier in the long run." Thirty-eight of the forty subjects selected a response to statement 9. One subject who did not select a response commented, "to some degree, perhaps." The total score for statement 9 was 171. The average number of points per respondent was 4.5. Statement 9 produced a consistent set of responses. All subjects who selected responses indicated agreement (refer to Fig. 9).

Figure 9. Comparison of percentages of teacher responses to statement 9 of the Teacher Attitude Scale. Mixed or no response = 5% .

Statement 10. "CT skills are largely dependent on intelligence." Thirty-seven of the forty participants in the survey selected given responses to statement 10. One subject did not respond. Two other subjects provided mixed responses of 3-unsure and 2-disagree. A total of 94 points were calculated for this statement with an average of 2.5 points per respondent. This statement evoked the most 3-unsure responses. Nearly 1/3 of those surveyed reported that they were unsure as to whether or not critical thinking skills are largely dependent upon intelligence. Research indicates that critical thought is not exclusive to those

with above average, gifted or genius levels of intelligence (Reid & Hresko, 1981; Ruggiero, 1988). A comparison of the results is illustrated in Figure 10.

Figure 10. Comparison of percentages of teacher responses to statement 10 of the Teacher Attitude Scale. Mixed or no response = 7.5% .

Discussion

Activities, Methods, and Strategies

The activities, strategies, and techniques which teachers reportedly use to develop critical thinking skills are varied, but most are suggestive of an integrated approach. In other words, teachers involved in the study favored integrating critical thinking skills instruction with content area instruction and social skills instruction rather than teaching these skills in isolation. Sternberg

(1983) reported that such integration is essential. He emphasized that programs must be relevant to students' needs and interests and should take into account the real-life problems of students.

Obstacles and Strengths

Teachers provided a list of factors that positively affect critical thinking and a list of obstacles to critical thinking that were logically opposing lists. The factors they supplied concur with the research and were, therefore, largely as expected. The only difference was that teachers emphasized the importance of home environment and language development more than did the literature.

Teacher Attitude

In general, teachers indicated agreement with favorable statements (odd numbered statements) on the teacher attitude scale. They most often indicated disagreement with less favorable (even numbered) statements. Therefore, most teachers who participated in the study recognized the importance of teaching critical thinking skills to their students with learning disabilities. This result was expected, due to the self-selecting nature of the study. That is, one would expect that those who took the time to complete the questionnaire and return it would have an interest in the topic of critical thinking skills instruction.

The inconclusive set of responses to statement 7 on the

Teacher Attitude Scale, "My students have greater needs in the area of CT skills than do students without learning disabilities," was unexpected. The statement was based on results from recorded research (Barkley, 1981; Holborow & Berry, 1986). Some teachers responded that their students were good critical thinkers. However, these teachers did not agree that their students have adequate critical thinking skills and reportedly do involve their students in critical thinking skills instruction. Eighty percent of teachers who were involved in this study have taught students with learning disabilities during most, if not all, of their teaching tenure. Therefore, these teachers may have had few opportunities to compare their students' critical thinking skills with their peers who do not have learning disabilities.

The mixed response to statement 8, "The most important things I teach my students are basic skills...", resulted in part because some teachers assume that they integrate critical thinking skills instruction into basic reading, writing, and arithmetic instruction. Indeed, one subject indicated that she attempts to incorporate thinking skills instruction into basic skills instruction whenever possible. Also, while all of the teachers indicated that they teach critical thinking skills, some actually see basic skills instruction as a first priority. In fact, two teachers listed limited basic skills as obstacles to the development of critical thinking skills. Some teachers may view basic

skills attainment as a prerequisite to critical thinking. The reality is that the two can be learned concurrently.

The fact that 30% of the subjects indicated that they are unsure about the statement that "CT skills are largely dependent upon intelligence" may be due to conflicting evidence encountered by teachers in the classroom. While they may recognize that all of their students are capable of critical thought, they may observe that some of their brightest students arrive at appropriate conclusions more quickly than do their other students. While expedient problem-solving can be of value, it is not a necessity in all situations. Certainly, those with ordinary intelligence are capable of both critical and creative thought and those with high intelligence are capable of errors in judgment.

Conclusions

This study revealed that RSP teachers and SDC teachers with students in fourth through sixth grades who were surveyed recognize the importance of critical thinking skills instruction for their students with learning disabilities. Indeed, there are special educators who actively involve their students in such instruction on a regular basis. Sixty-eight percent of teachers who participated in the study supplied that they consciously involve students in critical thinking skills instruction at least daily. Fifteen percent of those teachers indicated that they try to integrate critical thinking skills instruction into almost every activity that they plan for

students.

Unfortunately, an apparent lack of consistency in approach exists. Teachers within each district varied as to the extent of emphasis they place on critical thinking skills instruction. While teachers as a group supplied numerous useful examples of materials, activities, strategies, and techniques, evaluation of individual questionnaires suggested a need for more guidance in the implementation of critical thinking skills instruction. Only four teachers representing four different districts reported having attended district workshops on critical thinking skills instruction. One of those four teachers indicated that there had been no follow-up support or encouragement to use the materials that were distributed at the workshop. In this researcher's district of employment, critical thinking skills instruction has been given minimal attention. The focus has been limited to an occasional inservice workshop, sending a few teachers to training workshops, and consideration during the textbook selection process.

This researcher suggests that more extensive planning and development of critical thinking pedagogy should be undertaken. Teachers would benefit from the development of a continuum of terminology and skills, as well as more thorough inservice training accompanied by peer coaching.

Implications for Further Research

The results of this study should be viewed with caution due to the small sample size and the self-selecting nature of the respondents. All interpretations made include the caveat that their validity is dependent upon larger scale replications of the study that limit self-selection. Questionnaires should be distributed and collected during district-wide special education meetings, SELPA meetings, and/or university classes in order to ensure an adequate sample size and eliminate the influence of self-selection on the results. A series of long-term classroom observations might also be added in order to validate that teachers actually teach what they say they teach.

CHAPTER V

SUMMARY

With a vast number of complex issues facing society, today's educators recognize the importance of preparing students to solve problems effectively. In the past, instruction designed to enhance critical thinking was traditionally reserved for students with above average or gifted levels of intelligence who were functioning accordingly in the academic setting. Educators now recognize that thinking skills that will improve critical thinking can be taught to most students and that most are capable of thinking at abstract levels (Fraenkel, 1973). Because students who have been placed in special education display basic skill levels well below their peers without learning disabilities, their instruction is too often limited to rote drill and practice activities. Research indicates that, while these students may display learning styles that hinder the attainment of critical thinking skills, they do not learn in a fundamentally different way than do others. Students with learning disabilities can and do benefit from thinking skills instruction and should, therefore, be actively involved in programs designed to develop and enhance critical thinking.

No previous study was located that focused on the attitudes of special educators toward critical thinking skills instruction for their students with learning

disabilities and the extent to which these educators involve their students in such instruction. This study was based on a teacher questionnaire designed to garner such information. The researcher mailed the questionnaires with cover letters to 20 school districts in California. Approximately 650 questionnaires were distributed to teachers. Twenty-seven resource specialists and 13 Special Day Class teachers completed and returned the questionnaires. The researcher tallied and calculated percentages for Personal Information and Student Information sections of the questionnaire. Responses to a Critical Thinking Skills Instruction section were collected and compared. The researcher then tallied responses to each of 10 statements on a Teacher Attitude Scale and calculated percentages, total points, and averages for each statement. Due to the small number of returned questionnaires, valid statistical analysis could not be performed. Therefore, a descriptive analysis was completed.

Interpretations of the results should be made with caution due to the limitations and delimitations of this study, namely limited sample size and self-selection. The results of this study suggest that the resource specialists and special day class teachers surveyed recognize the importance of including critical thinking skills instruction in their special education programs. Ninety-five percent of the teachers involved in the study indicated that they consider critical thinking skills instruction as important for their students as basic skills instruction; 68% of these

teachers reported that they consciously involve students in critical thinking skills instruction on a daily basis. Subjects favored an integrated approach to critical thinking skills instruction and corroborated the findings of researchers with regard to obstacles to the development of critical thinking.

Teachers who responded to the questionnaire most often selected the expected responses of 5-strongly agree and 4-agree for statements 1, 3, 5, and 9. These statements all reflected favorable attitudes toward critical thinking skills instruction for students with learning disabilities. Teachers most often selected the expected responses of 2-disagree and 1-strongly disagree for statements 2, 4, and 6. These statements all reflected indifferent or less than favorable attitudes toward the need for critical thinking skills instruction for students with learning disabilities. Unexpected results were obtained from statements 7, 8, and 10. Fewer subjects than expected selected responses 5-strongly agree and 4-agree, for statement 7. The most often selected responses to statement 8 were contrasting. Subjects most often selected 2-disagree and 4-agree for this statement. A large percentage of the subjects selected 3-unsure for statement 10.

Conclusions

Although resource specialists and special day class teachers involved in this study do consciously teach critical thinking skills, a lack of consistency was

apparent. A need for more support in planning and implementation emerged. The researcher proposes that a much greater effort is required to ensure that all students develop their critical thinking skills to the maximum extent possible.

An effective critical thinking skills program should include a continuum of skills to be facilitated at each grade level--that have been selected in accordance with levels of cognitive development. Detailed descriptions of procedures, rules, and terminology should be decided upon and used consistently. Since a climate that is supportive of freedom of expression and discovery is essential, cooperative learning should be encouraged. Guided practice, application of skills, and transfer should be considered in planning and demonstrated both to teachers and by teachers. Finally, teacher inservice and peer coaching should be implemented as vital components in such a program as should parent inservice (Beyer, 1987). If the special educators surveyed are going to affect substantial increases in their students' critical thinking skills, they will need to increase significantly the emphasis that they place on teaching critical thinking skills to children.

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APPENDIX A

TEACHER ASSESSMENT QUESTIONNAIRE AND COVER LETTER

**TEACHER ASSESSMENT
OF CRITICAL THINKING SKILLS INSTRUCTION
FOR STUDENTS WITH LEARNING DISABILITIES**

This Questionnaire is part of a master's thesis study and is designed to assess the attitudes of teachers who serve students with learning disabilities toward critical thinking skills instruction as well as to gather methods and strategies that are being used successfully. Completion of this questionnaire is of the utmost importance to the study. Please return the completed questionnaire to your Special Education Director, ASAP. Results will be shared with you via your district office.

PART I: Personal Information

Directions: Circle the appropriate response.

Age:	21-25	36-40	Gender:	M	F
	26-30	41-45			
	31-35	46 or over			
Ethnicity:	Asian	Black	Socio-	lower middle	
	White	Hispanic	econmic	middle	
	other_____		status:	upper middle	
Years	0-5	16-20	Years	0-5	16-20
taught:	6-10	21 or	taught	6-10	21 or
	11-15	over	in LD:	11-15	over
Current	RSP		Level of	BA or BS	
Position:	SDC-LH		Education:	BA+ or BS+	
				MA or MS	
				other	
Credentials:	Multiple Subjects-	Multiple Subjects-Clear			
	Preliminary	Single Subject			
	Resource Specialist	LH Specialist			
	other				

Part II: Student Information

Directions: Fill in the appropriate responses.

Age range of students _____

Number of students: Male _____ Female _____

Ethnic/Racial Breakdown: Asian _____ Black _____ Hispanic _____
White, non Hispanic _____

Socio-economic Breakdown: Lower _____ lower middle _____
middle _____ upper middle _____

Part IV: Teacher Attitude Scale

Directions: Using the scale below, circle the response to each statement that best indicates your agreement or disagreement with the statement.

	Strongly Agree	Agree	Unsure	Disagree	Strongly Disagree
1. Critical Thinking (CT) skills can be taught to most students, including those with learning disabilities.	5	4	3	2	1
2. I don't have time to teach CT skills.	5	4	3	2	1
3. I could (or do) make time to teach CT skills.	5	4	3	2	1
4. Introducing CT skills instruction into my program will make my job more difficult in the long run.	5	4	3	2	1
5. CT skills instruction is as important for my students as instruction in basic skills.	5	4	3	2	1
6. My students have adequate CT skills and do not need CT skills instruction.	5	4	3	2	1
7. My students have greater needs in the area of CT skills than do students without learning disabilities.	5	4	3	2	1
8. The most important things I teach my students are basic skills (reading, writing, and arithmetic).	5	4	3	2	1
9. Introducing CT skills into my program can help students minimize problems, making my job easier in the long run.	5	4	3	2	1
10. CT skills are largely dependent upon intelligence.	5	4	3	2	1

A campus of The California State University

College of Education • Division of Special Education & Rehabilitative Services
One Washington Square • San José, California 95192-0078 • 408/924-3700 • FAX 408/924-3713 • TDD 408/924-3701

Dear Special Education Teacher,

I need your help in conducting a study of special education teacher attitudes toward, and strategies for, teaching critical thinking skills to their students with learning disabilities. For the purposes of this study, critical thinking is being considered as a level of thought which involves the higher levels of thinking in Bloom's taxonomy (analysis, synthesis, and evaluation) and which also involves praxis or alternating reflection and action. Further, critical thinking involves conceiving of alternative candidates for belief and courses of action based on a moral and ethical component, and addressing problems and issues of concern to a group, society, or nation. Critical thinking in this sense, enables people to construct solutions to their problems and change their lives (Ahlquist, 1990; Hay, 1987). Attached is a questionnaire, asking about your feelings toward critical thinking skills instruction and about the strategies you may use to facilitate your students' critical thinking skills. Will you please spend fifteen minutes to complete the questionnaire and return it within the week to your Special Education Director (or whomever is in charge of directing special education services in your district)?

You should understand that there is no risk to you in participating in this study and that your participation in this study is voluntary. Choosing not to participate in the study will not affect your relations with San Jose State University. The results of this study will be shared with you via your district office. The information gathered from this study may be of benefit to you in your efforts to provide meaningful and appropriate education to your students with learning disabilities.

If you have questions about this study, I will be happy to talk with you. I can be reached at (408) 637-5808. If you have questions or complaints about research subjects' rights, or in the event of a research related injury, please contact Serena Stanford, Ph.D., Associate Academic Vice President for Graduate Studies and Research at (408) 924-2480.

Sincerely,

Ann J. Griffin
Graduate Student
San Jose State
University

APPENDIX B**CRITICAL THINKING SKILLS MATERIALS LIST**

MATERIALS

Materials are listed alphabetically as teachers recorded them. The district(s) from which the suggestion came follow(s) in parentheses when known.

General

Bloom's Taxonomy (Salinas)

Brain Teasers (Intermediate), Teacher Created
Materials, Inc. Westminster, CA 92683,
1-800-662-4321

Child Development Project (Cupertino, Salinas)

Concept Attainment (Milpitas)

Conflict Resolution (Hollister)

Cooperative Learning, Johnson and Johnson
(Hollister, Salinas)

Critical Thinking Activities, Dale Seymour and Ed
Beardslee (Hollister)

Drawing Conclusions Skill Cards

DTRA Directed Reading/Thinking Activities, Stampfer
(Hollister)

Feuerstein Activities: Syllogisms (Salinas)

Mind Joggers, Susan S. Ptreshene (San Jose Unified)

Mind Movers & Brain Teasers: Critical Thinking,
Cause & Effect, Inferences, Frank Schaffer
Publications

Organizing Thinking, by S. & H. Black, Midwest
Publishers, 1-800-458-4849

SIM Strategies Intervernion Model, by Donald

Deshler

Skills for School Success, by A. Archer & M.

Gleason, Curriculum Associates, 1-800-225-0248

Small Group Teamwork Problem Solving (Milpitas)

Steck-Vaughn Critical Thinking Series

Stop-Think-Plan regarding playground management

Structures for Conducting Discussions

Synectics and Basic Practice Model Strategies

Think Smarter, Study Smarter (Hollister)

Techniques of Problem Solving (TOPS)

Problem Solving Decks (Hollister, Salinas),

Summit Learning, P.O. Box 493 Ft. Collins, CO

80522, 1-800-500-8817

Language Arts

Corrective Reading, SRA (Salinas)

McCracken Activities Guides and Whole Language

Guides (Salinas)

Project Write

Reading Mastery (Fremont, Salinas)

Reasoning and Writing, Levels A, B, and C (Salinas)

Spelling Mastery (Salinas)

Word Analogy & Word Classifying Worksheets, by

Nancy Mann Allen, EBSCO Curriculum Materials,

DIV. EBSCO Industries, Inc. Box 11521,

Birmingham, AL 35202-1521, 1-800-633-8623.

Mathematics

Connecting Math Concepts (Hollister, Salinas)

Corrective Mathematics, SRA (Fremont)

Daily Mathematics: Critical Thinking and Problem
Solving, McDougal, Littell & Company, Box 1667
Evanston, IL 60204

Family Math

Math: A Way of Thinking

Mathematics Problem Solving Activities Books, by
Dale Seymour Publications, Available through
Summit Learning

Math for Girls and Other Problem Solvers (Salinas),
by Dianne Downie, Twila Slesnick, Jean Kerr
Stenmark, Lawrence Hall of Science, University
of California Berkley, 94720, Attn: Equals

Math Replacement Units: Gulliver's Travels, Seeing
Fractions, Used Numbers (Salinas)

Math Their Way

Touch Math Extensions (Salinas)

Computer Programs

Oregon Trail

TERC Computer Games (Salinas)