USING JOURNAL WRITING TO EVOKE CRITICAL THINKING SKILLS OF STUDENTS IN TEACHER EDUCATION

by

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(ABSTRACT)

There has been little research which shows that students use critical thinking skills when they write. The use of journal writing has been studied for a variety of purposes, but little evidence exists that journal writing can enhance critical thinking skills. The writing assignments presented in this study were designed to enhance the critical thinking skills of college students enrolled in a reading methods course at a small college in southern West Virginia. Case studies were used to describe the critical thinking skills used by the four participating students.

Each of the six writing assignments was developed to elicit as many critical thinking responses as the student could write during the time allotted in class. All of the writing assignments were completed within the framework of the reading class, and two of them were completed as collaborative group work.

Twenty critical thinking skills were used as the criteria for examining the responses that students used in their writing. The twenty skills were placed in
these four categories: Analyzing Arguments/Issues which included five critical thinking skills; Clarifying Information which included four critical thinking skills; Inferring which included six critical thinking skills; and Evaluating Arguments/Issues which included five critical thinking skills. These twenty critical thinking skills were coded so that they could be easily recorded on tables.

Findings indicated that the four participating students used more Inferring and Analyzing skills than they did the Clarifying and Evaluating skills. All of the skills were used at least one time in the six assignments. Students praised the journal for giving them an opportunity to “freely express ourselves.”
ACKNOWLEDGEMENTS

The work on this dissertation has been a most valuable experience for me. Were it not for the generosity of the time and the patience on the part of many people, such a rewarding experience would not have been possible. I wish to extend my thanks and appreciation to:

My committee members for making my dissertation experience productive and meaningful; to Patricia Kelly, who assured me that my study was worthwhile and for her assistance in organizing the case studies; to Paul Morgan for providing guidance in examining and analyzing the tables in the study; to Jerry Niles who, with his knowledge and expertise in reading research, gently steered me in the "right direction"; to Rosary Lalik, whose encouragement sustained me in the early stages of the study; and to Larry Weber, my chairman: Tanti ringraziamenti per vostra pazienza durante gli anni recenti chi abbiamo lavorato ensieme e per tutto vostro aiuto e incoraggiamento. Siete per sempre mio caro amico.

I am grateful to my students who participated in the study and for demonstrating to me that writing assignments can enhance critical thinking. I extend my gratitude to Mildred, who listened for hours and encouraged me every step of the way; to Joann, who made sure that everything would turn out all right; and to Leigh, for typing the manuscript of the research.

I offer this work in loving memory of my mother, Santina Sinicrope Serreno, who taught me about the "important things in life."

Finally, I acknowledge my family, Dora, Sammy, Gladys, Rose, Tony, and Teresa for understanding me as no one else could; and to Don, my husband, my
editor-in-residence and my best friend—thank you for always being there. And for John, thank you my son, for teaching me how to be a better mother.

To each of you, my humble thanks.
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CHAPTER 1

INTRODUCTION

Writing is perceived by Flower (1985) as a demanding way of thinking about what one knows because in the process of writing, ideas are being remembered, communicated and even tested by the writer. DiYanni advises that once the writer begins concentrating on his writing, on putting words on paper,

You'll find that one sentence leads to another, that one thought or phrase, sometimes only a word, sets something going in your consciousness or taps your subconscious and before you realize what's happening, you're writing and thinking together. (DiYanni 1985, 2)

Studies reveal that there is an excessive reliance on transactional and mechanical writing in schools and very little emphasis on expressive writing (Britton 1975, Fulwiler 1980, Applebee 1981, Emig 1983). Transactional writing is described by Britton as that writing which the students employ in reporting another's ideas or in verifying their own opinions by using someone else's words. Expressive writing encourages the students to explore, discover, and express their own ideas. Applebee described mechanical writing as the type of writing that does not involve composing by the writer but includes filling in the blanks, computing, translating, and copying. Fulwiler and Britton contend that schools promote communicative (transactional) and mechanical writing and neglect expressive writing. Journal writing is a form of expressive writing in which students “write themselves toward learning,” where the very process of writing
exercises and influences the process of thinking (Fulwiler 1980). Kirby (1980) concludes that, when students can write about what they experience or read, they become more aware of their reading habits; they are able to think creatively, and they are able to organize their thoughts.

**Need for the Study**

College students often relate their preference for a lecture-type class with the professor conveying specific information and then testing the students on how well they are able to recall that information. Studies reveal that such students have not been encouraged to think beyond the first three levels of the cognitive domain, i.e., recall, comprehension and application of Bloom's (1969) Taxonomy of Education Objectives. This situation is regrettable since common wisdom suggests that one of the primary purposes of college teaching is to enhance thinking.

That students throughout our public schools, colleges and universities are lacking in thinking skills has been documented by the Carnegie Foundation (1983) as well as the National Assessment of Education Progress (1981). Other studies reveal that thinking can be enhanced through writing exercises whereby students are able to express their thoughts freely. For instance, Flower and Hayes (1981) define writing as being a set of distinct thinking processes which writers organize during the time they are composing. Further, Forsman (1985) states that through assignments such as journal writing, students are able to learn how ideas emerge and how to organize, sort and select those ideas that they wish to develop.

The position held by some educators that it is impossible to teach thinking did not proceed from scholarly research but from the assumption that since
thinking was not being taught and had not been taught, therefore it could not be taught (Ruggiero 1986). Others have taken issue with this assumption, and no matter how compelling their arguments, they have not been able to convince many educators that students can be taught to think. Edward Glaser (cited in Ruggiero 1986, 3), in his publication, *Experiments in the Teaching of Critical Thinking*, listed over 340 important books and articles that documented and/or demonstrated that thinking can be taught. One of the articles listed by Glaser, "How We Think," was written by John Dewey in 1933 and stated, "...upon its intellectual side, education consists of the formation of wide-awake, careful, thorough habits of thinking" (Ruggiero 1986, 3).

Michelak (1986) contends that significant changes must occur in the behavior of college professors before the thinking abilities of college students can be enhanced. The problem, it appears, is not whether thinking can be taught, but whether teachers are willing to make the pedagogical changes needed to teach thinking.

**Focus of the Study**

The purpose of this study was to discover the kinds of thinking responses evoked in college students through a series of writing assignments. The six writings used for analysis in the study were recorded in the students' journals. Four of these writings were specific writing assignments completed throughout the semester and were prepared as part of the course (see outline of course in Appendix A). At the end of the semester, the other two writing projects were selected from the daily journal entries. These two writings represented the students' responses in collaborative group work.
The study focused on the critical thinking skills employed in the journal writings of four students (two traditional and two nontraditional) in a reading methods course titled “Reading Process.” This course is the first in a series of three reading courses required of all elementary education (K-6) majors.

In this course, the instructor’s task is to introduce and to facilitate the learning of various concepts of reading that include many skills for which the students will be assessed in their senior year by the state as part of the state testing program for certification purposes. Included in the course are various topics such as the language experience approach, directed reading lessons as used in the basal reading approach, webbing, structured overviews, vocabulary development, word recognition skills, comprehension skills, and informal reading inventories.

It was from this class that the four participants were selected for the study. They agreed to participate and gave their written consent with assurance from me that the information would be kept confidential.

Journals were used as a means of collecting students' writing since journals were already an integral part of the instructional framework of the course. The use of journal writing to promote and evoke thinking is well documented (e.g., Juell 1985; Fulwiler 1986; Feathers 1987). A search for literature on empirical research concerning the writing-thinking relationship resulted in numerous books and articles about writing and thinking and about journal writing and thinking, most of which were descriptive.

The writing assignments required students to “construct rather than reproduce” responses (Doyle and Carter 1984). In the first writing exercise, students were asked to recall when they learned to read and the situation in which
their reading began. The second writing assignment asked for responses to a hypothetical situation that involved a child ("The Nonconformist") in a first grade reading class. Assignment three asked for students to write a mid-term examination question on some aspect of reading that had been discussed in the class. Assignment four placed the students in the position of teaching a third grade reading class for one week. The fifth and sixth writing projects were selected from students' journals for the purpose of examining their responses in collaborative group work.

All of the writing projects were conducted throughout the semester, with the journal serving as a technique for students to use in collecting their writings. Beginning with the first week of class, students were asked to keep their journal entries in loose leaf notebooks so that they could have the freedom to remove or insert pages.

The critical thinking skills used in the analysis were drawn primarily from Robert Ennis' *Goals for Critical Thinking/Reasoning Curriculum* (1969, revised in 1980, 12-15). I merged the twelve critical thinking skills by Ennis into three broad categories and I added the category of Evaluation of Arguments/issues. These four categories are analyzing arguments/issues, clarifying, inferring, and evaluating arguments/issues. Table 1 presents a list of the four categories and their sub-skills that will be used in this study. The skills are not proposed as hierarchical but as nonlinear and recursive.

**Limitations of the Study**

1. Four students were used in the analysis. These students may not have been representative of the entire class.
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2. Writing was the vehicle through which critical thinking skills were examined. Students may have had mental thoughts or levels not used in the writing.

**Research Questions**

The following research questions serve as a basis for the examination of the writing assignments. The first research question focused on the types of thinking skills students used in completing the writing projects:

1. What thinking responses will the students use to complete a series of writing assignments?

The next research question concerned the examination of the thinking skills of traditional students and nontraditional students to determine similarities:

2. Do traditional and nontraditional students use similar thinking skills in responding to the writing assignments?

Question three was related to possible variations in the thinking responses elicited in the writing projects:

3. Are there differences in the thinking responses evoked by each writing assignment?

The last research question was to determine the difference in traditional and nontraditional students with grade point averages of A/B and those with a C grade point average.

4. Are there differences in the thinking responses of traditional and nontraditional students with a grade point average (GPA) of 4.0 - 3.0 and those with a GPA of 2.9 - 2.0?
Definition of Terms and Phrases

The following definitions will help in understanding this study:

**CRITICAL THINKING**

rational reflective thinking that focuses on what to believe or do.

**REFLECTIVE THINKING**
a process of analyzing one's own thoughts and behaviors.

**JOURNAL**
a student notebook that records the writer's personal experiences, recollections, observations, and reactions to course assignments, teaching strategies, and learning strategies.

**BRAINSTORMING**
a goal-directed procedure, frequently used in journal writing to stimulate creative thoughts. Ideas and thoughts are written without throwing out any of the ideas, yet keeping the goal or problem in mind.

**FREEWRITING**
writing out whatever comes to mind and continue writing for a specified amount of time. This procedure is often used in journal writing and is a way of exploring one's thoughts and feelings. The goal of this type of writing is in the process, not the product.

**TRADITIONAL COLLEGE STUDENTS**
those who enroll in college at age 18, are recent high school graduates, and are enrolled as full-time students.

**NONTRADITIONAL COLLEGE STUDENTS**
those who enroll in college for the first time at age 19 or older. Many of these students are not enrolled full-time at a college.

Organization of the Study

In Chapter 1, I have presented the need for the study, the focus of the study, the research questions, and a glossary of terms and phrases. I review the
relevant literature in Chapter 2. In Chapter 3, I describe the research methods, including the research site, the subjects, the teacher-researcher, the setting, and procedures for gathering and analyzing the data. In Chapter 4, I present case studies on the four students. Chapter 5 discusses the research questions and presents implications for education.
CHAPTER 2

REVIEW OF THE RELATED LITERATURE

Writing has a place in a variety of disciplines, not just in English (Applebee 1981). In Applebee’s 1981 study of secondary school writing, he discussed ways for improving writing in secondary schools. Primarily, his study called for “more situations in which writing serves as a tool for learning, rather than as a means to display acquired knowledge” (p 79).

This chapter presents a review of the literature as it is related to the focus of the study. The chapter provides a discussion of how writing is used across the curriculum; the thinking-learning process; journal writing as a tool for learning; critical thinking in writing; and Perry’s Scheme of Cognitive Growth.

**Writing Across the Curriculum**

When Jack Meiland (cited in Fulwiler 1987) asked his colleagues at the University of Michigan to identify the student writing problems that concerned them the most, the majority of them reported that students had problems with the basic writing-thinking connection. Since Meiland taught critical thinking in a specialized course designed for that purpose, he suggested that the best way to teach writing-thinking skills is to teach the associated forms of writing; for example, in order to teach skills of argumentation, the instructor must teach
students to write argumentative papers.

In an earlier study conducted by Applebee (1981), a category of writing was examined that he called "mechanical writing." He described this type of writing as one that does not involve significant composing for the writer but includes filling in the blanks, computing, translating, and copying. He found mechanical writing was by far the most frequently assigned writing in American junior high school classrooms. Other studies reported by Ruggiero (1988) and Michelak (1986) revealed similar findings in high schools and colleges.

The National Assessment of Educational Progress (1981) in their 1979-1980 assessment of reading and literature reported that few students could provide little more than superficial responses to tasks such as analysis of text, defense of judgement or points of view, and elaborating or extending their ideas. Those who gave "better" responses revealed little evidence of problem solving strategies.

Ruggiero related still another study done by the Carnegie Foundation (1983) that estimated that "big business" spends up to one billion dollars per year in corporation classrooms to teach fundamental skills and to develop thinking skills because schools have failed to do so. He contends that many teachers confuse "telling students what to think" with "teaching students how to think" (Ruggiero 1986, 5). As an example, he refers to some science teachers who believe that since a thinking process is at the core of every scientific endeavor, merely informing students of scientific achievements and having them duplicate some experiments in a laboratory will develop "scientific habits of mind." Ruggiero says that the same may be true of some English teachers and other teachers in the humanities who believe that exposing students to great thoughts and expressions will lead them to
their own thoughts and writings

Perhaps the myth that good writing is only important to English teachers is perpetuated when other content teachers rely mostly on short-answer tests and homework. However, when essays and research papers are assigned and teachers merely grade and correct them, the notion that writing is used to measure—not to create—is reinforced (Fulwiler 1986).

Toby Fulwiler, in an attempt to account for the fears and resentments some students have about writing, explains:

Something clearly happens between learning to write in the early grades, where many students truly enjoy writing stories and poems spun from their own imagination, and writing in the later grades, where students are most often assigned to expository and analytic tasks. The very switch from the comfortable, enjoyable, creative story form (poetic writing) to the more demanding, arduous, research-oriented exposition form (transactional writing) may account for some of the changed attitudes. (Fulwiler 1986, 126)

Perhaps even more significant than switching from comfortable to uncomfortable writing modes is the change in teacher responses since many teachers spend more time in eradicating errors than encouraging expression in student writing. Moffett (1981) exhibited a strong belief in the need for teaching writing for thinking and learning across the curriculum when he suggested that writing could be elevated to the point where it will teach other subjects instead of using writing to test other subjects. Fulwiler (1987) believes that since writing is a complex process, intellectual in nature and central to creative learning and proficient communication, it certainly deserves serious consideration, increased attention, and thoughtful practice across the entire school curriculum.

Arkle (1985) states that when students have a full grasp of the material and are able to develop their ideas, they are in the process of becoming better
thinkers. He refers to Rosenblatt’s explanation of how important it is to get students to think on their own about material. She says that the classroom atmosphere should be one of friendly exchange were students feel free to reveal their emotions and to make judgements. Moreover, Rosenblatt says that a frank expression of boredom or rejection is a more valid starting point than timid, docile attempts to please the teacher. She believes the teacher should not interpret reading material for students. They need to learn to trust their reactions to what they read so that they can reconstruct their own ideas. If the ideas are their own, interpretations will carry more weight for them. Perhaps the same idea could hold for writing. In learning situations that stress writing for learning and thinking, students are not just passive receivers of information because they are allowed to draw on their own experiences and resources and therefore gain ownership of their ideas.

**Writing for Learning and Thinking**

Writing has a unique value for learning, and Vygotsky (1962), in explaining the connections between learning and writing, states that changing from inner speech (a mode of learning in which one talks to oneself) to written speech requires the writer to engage in deliberate semantics, and structuring of the web of meaning; produce all the pieces (syntax, semantic, lexical, and rhetorical), precise connections are made. When people think and figure out things, they are doing so in symbol systems called “languages.” Most often the language is verbal, but other languages might be musical, visual, or mathematical.

Flower (1985) perceived writing as a particularly demanding way of thinking about what one knows because, by explicitly writing, one is remembering
and communicating ideas and even testing them. Much of the composing process centers on how to bring out thoughts and feelings that frame memories with meaning; and as writers work up memories for an audience (the reader), they are learning something about their own thinking (Moffett 1981).

Writing provides a way of thinking things through and making knowledge as verbal and explicit as possible. Easley (1989) refers to this process as recreating an experience on paper which she says requires reflective thinking in that a conscious search for meaning out of meaninglessness is occurring. Writing brings order, comprehension, and new skills to one's life experiences by requiring the person to reprocess past, meaningless experiences. Through reprocessing, Easley continues, even though one might not have learned from the experience the first time he was forced to deal with it, he can replay the experience to find meaning through writing. Making meaning out of experience is learning and should therefore play a key role in writing.

Flower and Hayes (1981) described writing as "a set of distinctive thinking processes which writers orchestrate or organize during the act of composing" (p 176). The act of composing, they say, is a goal-directed thinking process that is guided by the "writer's own growing network of goals." These goals are created by the writer's sense of purpose, and at times the writer changes the goals or even sets completely new ones that are based on what was learned in the act of writing.

In their study of the cognitive processes involved in composing, Flower and Hayes examined writers in thinking aloud protocols to capture a more detailed record of what was going on in a writer's mind during the composing act. In collecting a protocol, the writer is given a problem and then asked to compose
aloud near a tape recorder. The writer is given instructions to work on a task as he normally would except that he must think aloud. Everything that goes through his mind is to be verbalized, which may include “stray notions, false starts, and incomplete or fragmentary thoughts” (p 366). He is simply asked to think aloud just as a person does in talking to himself. The manuscript of such a session is called a protocol.

Flower and Hayes (1981) developed a cognitive process model of writing (see Figure 1) that was a result of what they saw in the composing protocols. Their model consisted of three units: the task environment, the writer's long-term memory, and the writing processes. Although this process model is presented in a linear sequence, Flower and Hayes point out that the process is interactive and recursive. That is to say, throughout all stages of the process (even when the first sentence is written), the writer is generating, revising, and reviewing.

At the beginning of the composing act, the most important element, Flower and Hayes insist, is the rhetorical problem. They present a school assignment as a simplified version of a problem “describing the writer's topic, the audience, and her role as student to teacher” (p 366). Since writing is a rhetorical act, writer's will attempt to solve or respond to the rhetorical problem by writing. However, Flower and Hayes report that the rhetorical problem in theory is very complex. “...it includes not only the rhetorical situation and audience which prompts one to write, it also includes the writer's own goals in writing” (p 369). If the writer's representation of the rhetorical problem is “inaccurate or underdeveloped,” she is not likely to solve or attend to missing aspects of the problem. Defining the rhetorical problem is of great importance in the writing process.
FIGURE 1

A COGNITIVE PROCESS MODEL OF WRITING

Source: Flower and Hayes (1981, p 370)
As the writer continues, Flower and Hayes say that the words in the growing text determine and even limit the writer's choices of what will come next. "When writing is incoherent, the text might have exerted too little influence; the writer may have failed to consolidate new ideas with earlier statements," they explained. The "basic writer" has a "dogged concern with extending the previous sentence" and a reluctance to proceed from what they are presently doing (text-bound planning) to more comprehensible decisions such as "where do I go from this point?" (p 377)

The writer's long-term memory is comprised of a storehouse of knowledge about the topic, the audience, writing plans, and representations of the problem. Flower and Hayes say that the long-term memory has its own internal organization of information; the problem is "getting things out of it" and finding the cue that will allow one to retrieve a network of useful knowledge. Another problem, they say, is reorganizing or adapting the information to meet the demands of the rhetorical problem. Britton (1975) had previously reported that the long-term memory has the "very convenient property that information, ideas, feelings, and even vividly recorded experience can remain there undistorted for years" (p 45). However, he stated, it is not a reservoir nor a warehouse; "We arrange what we keep, but we frequently alter the arrangement, and we have a more elaborate cross-referencing system than any computer yet devised—so we need special procedures, and we're not always sure what those procedures are" (Britton 1975, 45).

In the Flower and Hayes model, the process of planning involves the act of generating ideas (retrieving information that is relevant to the problem) from long-
term memory. Ideas and thoughts will develop from information generated. These ideas and thoughts may be well developed and organized, while at other times they could be unconnected, fragmentary, or contradictory. The process of organization makes it possible for the writer to categorize and search for subordinate ideas with which to develop or to extend the topic. Goals are created by the writer, most of which are "generated, developed and revised by the same processes that generate and organize new ideas" (p 372). The translating process involves the writer in manipulating written English demands—from "syntactic and lexical ones down to the motor tasks of forming letters" (p 373).

The two sub-processes of reviewing and evaluating and revising may lead to new cycles of planning and translating. The process of reviewing could also occur as unplanned action brought about as a result of an evaluation of the text or of the writer's own planning. The processes of generating, revising, and evaluating can interrupt any of the other processes and can occur at any point in the writing act.

In the model, the monitor functions as a determinant of when the writer will move in and out of one process based on the writer's individual writing habits or styles. The authors of this model (Flower and Hayes 1981) contend that the model is a tool for researchers to think with. Thinking is at the center of this recursive process.

Although this cognitive theory of process is presented in a linear sequence, Flower and Hayes conceive the process as interactive and recursive, that is, throughout all stages of the process the writer is generating and revising plans and revising and reviewing even when the first sentence is written. Thinking is at the center of this recursive process in retrieving information from memory, generating
plans, reviewing, and monitoring the entire process.

Although there is some belief that people learn to write by writing, this does not mean that they learn to write by drilling for skill development. Anne Berthoff’s theory (1981) is compatible with Flower’s and Hayes’ because she says that writing is a nonlinear, dialectical process in which the writer continually circles back, reviewing and rewriting. Berthoff refers to a nonlinear, dialectical process as one in which events are not fixed in a rigid order and the writer is free to examine ideas. The way to learn this process is to practice it, Berthoff says. However, if students have been taught anything at all about writing, they were taught “wrongheaded things” such as outlining as a first step, not writing at all until you know what you want to say, and avoiding generalizations. Berthoff pointed out that even though she has taught students who have learned to write with such rules, she prefers teaching those who have had no training because it is far easier than “unteaching” those who have been taught “wrongheaded things.”

Susan Horton (1982) says that finding an idea that needs investigation or just finding something to write about is really the hardest part of writing for most students. However, she perceives writing as playing an important role in allowing students to work with an idea and to give that idea shape. While working with an idea, it is brought to full consciousness; thus, one thinks by way of writing.

As a result of his research in England, Britton (1975) points out that expressive writing (called “reflexive” by Emig [1977]) is basically a form of thinking, a mode of learning that is different from talking, reading, or listening. Emig explains the writing process as being more important that the written product because the process of writing exercises and influences the process of thinking, while the product evaluates and measures student performance.
Emig (1977) referred to Jerome Bruner's three major ways of representing and dealing with actuality (enactive, iconic, and symbolic) and explained this theory as "simultaneously or almost simultaneously deployed" in writing. Emig concluded that

the symbolic transformation of experience through the specific symbolic system of verbal language is shaped into an icon (the graphic product) by the enactive hand. If the most efficacious learning occurs when learning is reinforced, then writing through its inherent reinforcing cycle involving hand, eye, and brain marks an uniquely powerful multi-representational mode for learning. (Emig 1977, 126)

Flower's model (1985) of how communication through writing takes place depicts the writer as a combination of a radio announcer and a transmitter that sends messages through the air waves. The sender (writer) has a meaning in mind and encodes that meaning into a message that is then sent to the receiver (the reader). The sender has the task of encoding this meaning in a form to send to the receiver. In the process of turning the meaning into a message, some interference (noise) may occur such as misspelled words, poor grammar, poor organization or unclear thinking. All of this interference makes the message less clear. Finally, when the message reaches the reader, he has to decode that message into meaning while contending with other interferences such as being tired or confused by the subject or facing an unknown word. Each instance of interference breaks down the communication a little more. This model demonstrates that no matter what the writer means in his message, or what messages are sent, the final decoded meaning that the reader receives is what counts. Flower admits that one limitation of her model is that it cannot help us understand how readers actually decode a message. For a reader to comprehend
the written message, he must create a meaning in his own mind. The writer's work is really evidence of a mind in the process of thinking (Horton 1982).

Writing taps deep elements of cognition (Yinger 1985) that help in describing the framework through which one views his world. Once this information is written, it is available for reflection and evaluation. Yinger declares that journal writing can provide an opportunity for a person to engage in a meaningful writing activity because the writer is free to decide what he will write about and how he will express himself. Fulwiler (1986) extends this idea and stresses that without writing, developed thinking is seldom possible, for when we speak with others or ourselves, much of what is said is lost because it is not written down. Consequently, these ideas cannot be extended or expanded since we cannot see them. He declares that journal writing stimulates classroom discussion, helps to clarify unclear issues, reinforces learning and helps to stimulate imagination.

**Journal Writing**

As an instructional tool, journal writing has given college students an insight into problems that affect their ways of studying and has helped them to develop a sense of responsibility for their own learning (Yinger 1985, Self and Arababi 1983, Fulwiler 1988). Tompkins (1990) perceives journals as valuable tools for learning because, as students write, they think about what they are learning, relate it to prior knowledge, and question information that is not clear. Journals can offer various writing activities for college students in all disciplines. They can be used every day to write in, read from, and talk about, and they can take the place of routine assignments such as homework.
Juell (1985) believes that when students write in their journals, they need to know that they are cultivating thought so that each time they write, they are individualizing their instruction as they focus on the content of the course. The very act of writing, even for a few minutes, can generate ideas, observations, and emotions. Fulwiler (1980) encourages students to experiment with their journals by writing often and regularly on a variety of topics and to take some risks with form, style, and voice.

The journals can be useful in identifying the thinking process used by students so that pedagogical approaches can be altered if necessary. Fulwiler perceives the journal as the student’s own voice, and the student must know this and the instructor respect it. He recommends that students include personal knowledge and experiences as they may relate to the topic because the students learn and absorb, and “in the end, all knowledge is related; the journal helps clarify relationships” (Fulwiler 1980, 19).

Johst (1982), in interpreting Britton’s research, points out that nearly half of all student writing is from pupil to examiner which carries the pressures and anxieties that are inherent in such communication. Johst comments that if writing is used in classes other than English, the anxieties may diminish. The problem with writing anxiety is that students who write only for the teacher (the examiner) fail to learn how to write to other audiences. He believes that with this limited use of written communication, students will be ill-prepared for adult life where they will be faced with writing to other audiences. His solution is to simulate other audiences for students; nevertheless, he adds, the students are still writing for appraisal by the instructor.
A procedure often used in journal writing to stimulate creative thought is called "brainstorming." Brainstorming is a method of problem solving in which all members of a group spontaneously contribute and share ideas. Flower (1985) devised three rules to protect the "half-formed" ideas used in brainstorming from being censored by the writer. The first rule is to write down any ideas and resist the temptation to throw out ideas and start again. She warns not to censor any possibilities. The second rule is: do not stop to correct spelling or grammar, and do not attempt to write perfect prose. The third rule she imposes is to keep the problem or goal in mind since brainstorming is a goal-directed search for ideas. Weiss (1982) and Berkenkotter (1986) describe this type of problem solving procedure as a memory retrieval aid.

In describing "free-writing" (a technique often used in journal writing), Peter Elbow (1981), stated that the writer does not have to think hard or prepare or be in the mood; without stopping, he writes whatever words come out whether or not he is thinking or in the mood. He says that this process will immediately illustrate for most writers the relationship between thinking and writing. Flower (1985) perceives free-writing as another way for the writer to explore his thoughts and feelings. In this procedure, she explains, the student writes out whatever comes to mind as if he were taking dictation from his imagination. If he is unable to think of something to write, he writes, "I cannot think of anything to write" or another such phrase or word until some idea comes to mind. Flower states that free-writing is especially valuable when the writer feels blocked or insecure about his writing. He simply writes for ten minutes or so and lets his thoughts "wander in the storehouse of his memory" (p 81).

Berkenkotter extends the concept of free-writing. She states:
Free-writing helps a writer turn off his or her mental "editor" (who is often preoccupied with the "good manners" of writing, such as spelling and grammar) and as one writer who was trying to overcome a block put it, "free write your way to freedom." (Berkenkotter 1986, 36)

Moffett (1981) recommends a journal writing procedure that he calls a "monologue." The writer invents or reproduces a conversation between two people by writing down just what each speaker says in turn. No quotation marks are used, but the character's name is written followed by a colon. The time, place, and circumstances should be clear from what the characters say. The location of the speaker and the identity of the listener should come through from what the speaker says. This type of task is designed to bring out thoughts, feelings, and memories and to help the student learn something about her own thinking.

The dialogue writing strategy is one in which two voices, A and B, discuss or argue some controversial issue. Moffett (1981, pp 65-66) recommends this strategy for producing as many ideas as possible about a subject and for exploring all sides of an issue. Students who "go blank" when faced with a question that asks them to discuss an issue may come up with better and more honest ideas if permitted to use the dialogue.

Moffett suggests that reflecting on an issue or problem in dialogue writing is a kind of conversation brought about from previous points of view and then incorporated into one's thoughts. This merging of thoughts is a result of contact with others and from experiences that are ever-changing. Students generally should be involved "in a lot of class discussions" because, as Moffett contends, "thinking is to some extent an internalization of speed of conversations one has had and heard" (Moffett 1981, 66).

Anne Ruggles Gere (1985) described a dramatic scenario as a writing
strategy where students are asked to respond to a situation of conflict drawn from subject matter and to project themselves into the situation. This writing strategy, she says, increases students' involvement with topics being studied.

Focused writing, another writing activity that can be used in journal writing, invites students to concentrate (focus) on one idea for a specified duration and to explore its potential for new understandings (Juell 1985). This strategy, like brainstorming, enables the writers to “see how much they have to say on a given subject” (Gere 1985, 224).

Linda Flower (1985) describes nutshelling as another type of writing strategy that asks students to identify central ideas in given information. She points out that the selection process used in nutshelling is essential to critical thinking.

Journals should not be graded, and Fulwiler (1987) suggests sharing entries with others in some way to give credibility to the assignment. Juell (1985) adds that through the act of sharing, students can learn from each other's perspectives and can establish responsibility for their own thinking. Memorization of facts will not be found in this type of classroom activity, but writers are able to question, evaluate, and resolve problems.

Leahy (1985) and Self and Arababi (1986) state that journals can be indicators of what material was easy and what was difficult to understand and whether lectures, discussions, and field and laboratory experiences were clear or vague. In addition, Frazer and Malena (1986) used the journal as a diagnostic tool for detecting emotional problems, study habits, and time management in college developmental reading courses. The journals focused on schoolwork that
included how they felt about studying, participating in class, thoughts about the
textbook, taking notes, test taking, and areas that they experienced success and
failure. Once the students' problems were diagnosed, the instructors planned
strategies to help individual students. Instructors gained diagnostic information
from this experience, and the students benefited from their reflective thinking
through the journal writing process.

Similar results were found in a study done by Karen Feathers (1987) in
which she analyzed comments from journal entries of freshmen enrolled in
developmental reading classes. Eleven categories emerged from the data: group
feedback; putting things in their own words; notes; summaries; maps; text features;
active reading/prior knowledge; focus on process; studying; scheduling; and test-
taking (Feathers 1987, 267-68). She claims that the entries provided evidence of
metacognitive awareness because comments increased in the categories of "active
reading" and "text features." There was growth of students' understanding of how
they read and studied which Feathers attributes in part to their journal writing.
She concluded that journal writing can enhance instruction. Furthermore, she said
that instructors can identify which students are understanding and which are not
and determine where students are having difficulty.

Fulwiler (1987) cites Britton (1975) in explaining the language of journals as
resembling written speech. Journals will have qualities often associated with
conversational language, such qualities, Fulwiler said, include colloquial diction -
the choice of words will be short and simple. There may be contractions,
abbreviations, and other short-cuts; and first person pronouns with the frequent
use of "I" by the writer to reflect his own position or to signify that this is what he
is thinking rather than what someone else thinks.
Instructors should point out that journals are neither diaries nor class notebooks, but, like diaries, the entries are written in the first person about events or issues that the writer cares about; and like the class notebook, journals are concerned with the content of a particular course (Fulwiler 1987).

By reading what students write, teachers become humanized (Fulwiler 1986) because they are in touch with their students’ frustrations, joys, excitements, and anxieties. Journals record each student’s personal, individual travel through the academic world and can serve as springboards for formal writing. Journal writing, he continues, generates independent thinking in the classroom so that an assignment can be made richer by including written dimensions to encourage personal reflection and observation.

While examining the “better” journals (in terms of students’ performance in his classes), Fulwiler found that these journal entries were inquisitive, informal, reflective, contradictory, subjective, exploratory, and contained doubts and questions. He concluded that students who adopted a more informal, exploratory position were more likely to translate the course material in their own words that enhanced their understanding of that material. Journals are active, methodical records of student thought and opinion during a given term and are meant to help students prepare for class discussions, study for examinations, think critically, and write critical papers.

**Critical Thinking**

Moss and Petrosky (1983) relate the difficulty in defining critical thinking as a series of discrete skills or steps because thinking critically is nonlinear. They say
that “to think critically is to question public statements, beliefs, and definitions and
to consider what might have been and what may yet be” (Moss and Petrosky 1983,
2-3). Ennis’ (1987) theory is in agreement with that of Moss and Petrosky, but he
adds that the concept of higher order thinking is vague. Moreover, he emphasizes
that critical thinking has served the purpose of reminding schools and colleges that
there is much more cognitive material to be acquired than just memorized, “soon-
to-be-forgotten” facts. Therefore, Ennis (1987, p 10) gives a “working definition”
of critical thinking as “reasonable reflective thinking that is focused on deciding
what to do or believe.” The formulation of hypotheses, alternative ways of
viewing a problem, questions, possible solutions, and plans for investigating
something are creative acts that come under this definition (Ennis 1987, 12-15).
Ruggiero defined critical thinking as “the means by which arguments and
assertions are assessed in light of available information” (Ruggiero 1988, 2).

The lower three levels of Bloom’s (1956) taxonomy—recall (or knowledge),
comprehension, and application—serve to remind us that schools could be doing
much more than promoting these three levels of thought. Ennis (1987, p 10) and
Moss/Petrosky (1983, p 7) point out that many educators consider Bloom’s top
three levels—analysis, synthesis, and evaluation—as the higher order thinking skills.
However, Ennis is critical of Bloom’s taxonomy and asserts that these top levels
provide little guidance as a set of higher order thinking skills for schools. He
contends that the concepts are too vague and that the taxonomy does not offer
criteria for making judgements.

Having stressed the basics over the years, departments of education are
now moving toward accountability for higher level skills as well. Quellmalz (1987)
reports that California and Connecticut are developing state assessment programs
that are to address higher order thinking skills. In this program, students are asked to write persuasive, expository, and narrative essays based on their background experiences and to write essays in which they interpret passages from various content fields. These kinds of writing assignments will encourage students to go beyond simple recall and summarization of their knowledge. Some school systems have initiated programs in the elementary grades as well as in grades 8 through 12 where students are asked to compare, predict, infer, interpret, and evaluate problems or issues (Quellmalz 1987, 92-98). Basic methods of teaching these skills, i.e., written or oral interpretations, were not presented in that report.

According to Perkins (1987), most efforts to teach thinking skills take the form of “stand-alone” courses rather than instruction that integrates thinking skills with the content. In these courses, teaching students to think is done on the side, not in context. Perkins believes that from a practical point, this is far simpler than trying to alter instructional style throughout a school system. Even though some of the stand-alone courses are effective in meeting their immediate objectives, the principle risk is the lack of transfer of learning. Consequently, he says, teaching thinking in “stand-alone” courses may have little impact on subject area performance (Perkins 1987, 47).

Integration of critical thinking with the content is compatible with Slavin’s opinion (1991) because he contends that an important goal of teaching is to create a critical thinking spirit which is one that encourages students to question what they hear and to examine their own thinking for fallacies and inconsistencies. Moreover, Moss and Petrosky feel that an emphasis on oral and written expression is central to instruction as well as to the measurement of critical thinking. They say that talking and writing are generative in the same sense that thinking is
generative, that is to say,

when students think, talk, and write, they make meaning; and when students focus on making meaning in critical ways, they end up with extended discourse which can both create and present critical thinking. The expressions of critical thought—discussions, compositions, and other types of presentations—are ways of both discovering and verbalizing questions, conclusions, and the paths by which those conclusions were reached. The substance and quality of these expressions provide evidence of more or less critical thought. (Moss and Petrosky 1983, 3)

Quellmalz (1987, p 19) proposes that the goal of higher-order thinking is to have students engage in what she refers to as “purposeful, extended lines of thought in which they use problem solving strategies and become skillful in monitoring, evaluating, and improving those strategies.” Students learn critical thinking skills as they write, and Tompkins (1990), Fulwiler (1987), and Applebee (1981) iterate the belief that when students use the process of taking a point of view, organizing their writing, and appealing to an audience, they are, in fact, using higher level critical thinking skills. Gere (1988) characterizes the technique of writing-to-learn as a strategy that encourages critical thinking where learning comes from the actual process of writing. It is a strategy that perceives teachers as guides, not dispensers of information.

Walden (1989) describes a variety of assignments in writing to develop skills in inference, deduction, and induction. These assignments include freewriting; rereading journal entries, which is a reflection on this experience; noting ideas that stand out and questions that might occur; writing a hypothetical question for the course and answering the question in the journal; and designing assignments that promote connections with current issues in the world.

Journals contribute to the development of skills in critical thinking in a
number of ways. Walden (1989) described the dialogue, a basic journal technique for enhancing critical thinking, as being especially effective in helping students to develop skills in dialectical thinking and to understand alternative points of view. Richard Paul (1990) defined “dialogical thinking” as that which “involves a dialogue or extended exchange between different points of view or frames of reference” (p 547). Walden points out that a dialogue can be written during class time and involves the writer and usually someone they know. The learners’ voice may or may not be part of the dialogue. In any case, the writer is actively exploring alternative points of view. The ability to articulate and understand someone else’s point of view or someone else’s perspective is a key critical thinking skill, and the dialogue is a creative way to develop this ability. Many students find the technique difficult, but Walden contends that it is one of the most engaging and effective uses of the journal.

When a team of educators (Wales, Nardi, and Stager 1987) discovered that their college freshmen (at West Virginia University) had difficulty with problem-solving, they set out to make a difference by integrating thinking with the subject matter. They introduced a two-semester sequence of courses for freshmen and reported that before the thinking course was introduced, the grade point averages (GPAs) of these freshmen were below the university average. However, after completing the thinking course, the GPAs of these same students were above the university average. The gains, they say, persisted through all four years, and the graduation GPAs of the “thinking” students were 25 percent higher than the GPAs of transfer students in the courses who had not participated in the program. Since students made better grades, more were able to continue in their studies, and the percentage who graduated from the program increased by 32 percent from
previous years.

In a written report for the National Research Council (NRC), Lauren Resnick (1987, p 16) charged that "if we can find effective ways to teach them [thinking skills], we can imagine an important increase in educational efficiency." The report also points out that there is a direct parallel between the kind of thinking used in reading with the kind of thinking required for writing. Students "cannot become good writers without engaging in complex problem-solving-like processes" (Resnick 1987, 45).

In their research Wales and associates recognized the problem that teachers have with effectively teaching thinking skills and claim that they solved it by teaching students how to use the process of decision-making and how to apply this process in any discipline. Their model, called "The Process of Decision-Making" (Resnick 1987, 18-20), follows this five step process:

1. Define the problem, asking, "Who is involved?"; "What things are involved?"; "What happened?"; "When did it happen?"; "Where did it happen?"; "Why did it happen?"; and "How serious is it?"
2. State the goal
3. Generate ideas
4. Prepare the plan
5. Take action

The authors of this five step process declare that it has been successfully applied at the undergraduate and graduate levels in a variety of disciplines such as pharmacy, philosophy, nursing, business, biology, anthropology, engineering, and English. In these disciplines, they say, students learn that "each problem they solve is complex and involves multiple options, uncertainty, and conflicting criteria" (p 48). One of the significant problems with developing thinking skills is
described by Resnick's report to the NRC:

Thinking skills tend to be driven out of the curriculum by ever-growing demands for teaching larger and larger bodies of knowledge. The idea that knowledge must be acquired first and that its application to reasoning and problem solving can be delayed is a persistent one in educational thinking. (Resnick 1987, 48)

Ennis (1987, pp 12-15) developed a taxonomy of "critical thinking abilities" which he lists "in an order in which they might appear in a critical thinking course at the college level." His taxonomy includes twelve critical thinking abilities (skills) which he categorizes in four basic areas: clarity, basis, inference, and interaction.

Moss and Petrosky (1983, pp 2-3) argue that critical thinking cannot be tested appropriately by short-answer and multiple-choice formats, for to do so would indicate that a "correct" answer exists. In such a case, a correct answer may be the result of a lucky guess and does not adequately explain, validate, or defend the response generated by the test-taker. The same argument is true for "incorrect" answers. They point out that multiple-choice and short-answer items, while simpler to use than essay questions, provide very little insight into the processes that generated the student's response and therefore are not particularly useful for diagnostic purposes.

In a three year critical thinking project that they conducted for the Pittsburgh Public School System, Moss and Petrosky used a testing procedure in which students were asked to read passages relevant to their social studies curriculum and were then asked to write essays in response to questions which asked them to do such tasks as evaluating or drawing inferences from what they read. An analytical scoring guide was developed with six categories which
teachers could apply to their essays in order to obtain diagnostic information. The six categories in the scoring guide are topic statement, evidence, explanations, concluding statement, organization, and response to task. There were four possible standards in each category ranging from not present to “standard exceeded” (p 3).

The problem with the use of essay tests for district-wide testing, in addition to the enormous amount of time involved in developing and reading essays, is the difficulty, reliability or consistency in the scoring. Moss and Petrosky conclude that they are not “overly concerned” with the lack of reliability since the test is used primarily for diagnosis, for planning instruction, and for conferring with students.

The point is not whether our students can recognize or produce an answer that the teacher or some other authority considers correct, but whether they are able to adequately explain, validate, and defend the responses which they have generated. We certainly do students a disservice when we do not encourage them to explain and support their responses. Perry conducted a study to analyze students’ verbal responses of their interpretations

Perry’s Scheme of Cognitive Growth

William Perry (1981) and a group of teachers and counselors at Harvard University asked freshmen students (volunteers) at the end of the year “what stood out” for them in their experiences at the University. These students returned each year to answer the same question and their responses were audio-taped. Perry and his associates found that the students' interpretations from year to year fell into logical patterns. They were able to describe the structure of the students’
successive reinterpretations of the world and the precipitation of the challenge. They made a map of the “scheme of development,” i.e., a course of students’ patterns of thought. This scheme was found to be characteristic of the development of students’ thinking throughout a variety of settings. A discussion of Perry’s nine Positions of cognitive growth follows.

Nine Positions of Cognitive Growth

Position 1: Basic Duality

Students are imbedded in a world “out there” that is “We-Right-Good” and “Other-Wrong-Bad.” Right answers for everything in the world exist in the Absolute, and this information is known to Authorities (teachers) whose role is to teach or mediate these Truths. Knowledge and goodness are achieved through working hard and being obedient. A student in this position might say to a prospective student, “If you come here and do everything you’re supposed to do, you’ll be all right” (Perry 1981, 81). The transition from Position 1 to Position 2 brings changes quickly with the first challenge coming from peers who believe that differences of opinion cannot exist in the Absolute. “Some of our own Authorities disagree with each other or don’t seem to know, and some give us problems instead of Answers” (p 81).

Position 2: Multiplicity Prelegitimate

In Position 2, the student gives meaning to diversity, uncertainty and complexity in the realm of Authority by accounting for them as “mere exercises set by Authority,” so that “We can learn to find the Answer for ourselves.” The student says, “But even Good Authorities admit they don’t know all the answers
yet" (p 82) in the Transition from Position 2 to Position 3. He generalizes (from the concessions in Position 2) that right answers are being sought by Authorities, too.

Position 3: Multiplicity Legitimate but Subordinate

The student in Position 3 believes that “there are definite answers, but you can’t reach them yet.” The Truth is out there to be found, and uncertainty is only temporary. There can be some diversity of opinion, but this is only temporary. The transition from Position 3 to Position 4 loosens the tie between Authority and the Absolute. “Uncertainty is now unavoidable.” The “amount” of work is left up to the individual, and Authority is ignorant of how much work the individual does. The student, confused now, says such things as: “I don’t know, I still haven’t exactly caught onto what, what they want.”; “There are so many things they don’t know the answers to! And they won’t for a long time” (pp 82-83).

Position 4a: Multiplicity (Diversity and Uncertainty) Correlate

This Position brings about a new structure. Students create the double dualism of a world with the Authority’s right-wrong world as one element and personalistic diversity (Multiplicity) as the other. Students in this Position might well say, “Authorities do not know the Answer, any opinion is as good as any other” (p 84). Students’ capacity for meta-thought (thinking about thinking) and comparing assumptions and processes of various ways of thinking has not yet emerged. Although students still have much to learn about the relations of facts and opinions at the transitional Positions between 4a and 5, what they have
learned represents a real potential for growth.

Position 4b: Relativism Subordinate

The student at Position 4b, who was previously "a holder of meaning," becomes "a maker of meaning," and independent thought emerges (p 87). In the transition from Position 4b to Position 5 (Relativism), the shift from what (content) to how (generalized process) is a move to a higher level of abstraction. It is implied at this Position that the student is no longer memorizing facts but has the ability to make meaning because he can see more than one approach to an issue. "In certain courses Authorities are not asking for the Right Answer; they want us to think about things in a certain way, supporting opinion with data. That's what they grade us on" (p 88).

Position 5: Relativism

The student in Position 5 possesses an expansion of new skills and is able to explore alternative perspectives in a variety of disciplines and areas of life. Yet, it is apparent to them that even with searching, sorting out, and learning, areas will remain where knowing will be uncertain and where "reasonable people will reasonably disagree." The students asks, "...if everything is relative, am I relative, too? How can I know I'm making the Right Choice?" (pp 89-90)

Position 6: Commitment Foreseen

Emerging commitments characterize Position 6. The "feel" of commitment is an "internal disposition through which one apprehends the possibility of orienting oneself and investing one's care in an uncertain and relativistic world"
(Perry 1981, 94). One student expressed her emerging commitments in this way: “I see I'm going to have to make my own decisions in an uncertain world with no one to tell me I'm Right. I'm lost if I don't. When I decide on my career (or marriage or values) everything will straighten out.”

Position 7: Initial Commitment

Making the first Commitment, the student wonders, “Why didn't that settle everything?” One Commitment, he finds, does not order all of one's life. When further Commitments are affirmed, there is a necessity to balance them and establish priorities among them; “How many, how deep? How certain, how tentative?” The transition produces contradictions; “I can't make logical sense out of life's dilemmas” (p 94).

Position 8: Orientation in Implications of Commitment

When several commitments are affirmed in one's life, there is a need to balance them and to establish priorities among them “with respect to energy, action, and time” (p 95).

Position 9: Developing Commitments

Position 9 effects a feeling of realization that “This is how life will be. I must be wholehearted while tentative, fight for my values yet respect others, believe my deepest values right yet be ready to learn. I see that I shall be retracing this whole journey over and over—but, I hope, more wisely” (Perry 1981, 79).
Deflections from Growth

Perry described three deflections from growth where students might have found a more positive resolution to a problem. These deflections are Temporizing, Retreat, and Escape. Temporizing can occur at any position, and instead of continuing to the next position, some students wait for a decision to turn up: “I'll wait and see what time brings, see if I pass the foreign service exam. Let that decide.” A more possible response might be: “...I don't get particularly worked up over things...so we'll just leave that for the future...once you get this idea, then you're constantly waiting for the big chance in your life.” Students feel helpless and uneasy in trying to cope with the responsibility of making a decision (Perry 1981, 90-91).

Some students Retreat to another position. Unable to cope with higher levels in the diverse university community, and feeling alienated, they find security and safety in the Right/Wrong thinking. This deflection, Perry noted in his study, occurred in the dualism of Positions 2 or 3 but he said that general theory and observation suggest that one might regress at any point in the developmental scheme.

The third and final deflection of growth described by Perry and his associates is called Escape, the more complex reactions to alienation. This deflection might occur in positions 4 or 5. The students abandon responsibility and withdraw to Position 4a where they can hold on to their opinions without having to defend them. They might Escape to Relativism where they are unable to move on to Commitment where knowing is contextual. Perry (1970) reported that in some cases this deflection of growth became a permanent holding place, while
with others it was a resting point in transition to another Position.

In his initial study (1970), Perry found that no student was in Position 1 even at the end of the freshman year. Instead, most were functioning in Positions 3, 4, or 5, and at the end of four years, most of these students were found to be at Position 6, 7 or 8. None were functioning at Position 9, the most complex level of Perry's Scheme of Cognitive Growth.

Summary

Journals can serve as instructional tools for learning because as students write, they think about what they are learning; they relate it to prior knowledge; and they question information that is not clear. A variety of ways that journals can contribute to the development of critical thinking skills was discussed in this chapter. However, critical thinking is difficult to define as a series of discrete skills because thinking critically is a nonlinear process.

Easley made the very important point that writing provides a way of thinking things through and of making knowledge as verbal and explicit as possible. Adding to this point, Flower and Hayes described writing as a distinct set of thinking processes which is orchestrated during the composing act.

A search for studies which examined and analyzed the writing-thinking process produced two sources which were more concerned with the composing process (Flower and Hayes 1981, and Emig 1971). A study by Feathers (1987) examined how reading and learning could be enhanced through journal writing. The search for critical thinking and writing yielded two articles which were concerned only with critical thinking. The study by Moss and Petrosky (1983) diagnostically assessed the critical thinking of students, while the Wales, Nardi, and
Stager study was concerned with the use of a five-step process for problem solving.

William Perry (1981) and his associates at Harvard University conducted a longitudinal study with students from their first (freshman) year through the fourth (senior) year. They asked the same question of the students at the end of each year: "What stood out" for them in their experiences at the university. They were able to describe the structure or logic of the students' interpretations of the world and to identify the challenges that precipitated them. Each of the successive interpretations were given a numbered "Position." They called the map of these sequential interpretations of meaning a "scheme of development" and found it to be characteristic of the development of students' thinking "throughout a variety of educational settings" (p 80).

Slavin (1991, p 191) believes that, for the teaching of critical thinking to be effective, the classroom setting should be one that encourages the acceptance of divergent perspectives and student discussions. There should be an emphasis on giving explanations or reasons for opinions rather than on giving only correct answers. Moffett (1983) added that we can elevate writing so that it will teach other subjects instead of using writing to test other subjects; when the writer is making sense he is, indeed, making knowledge.

That industry believes that schools and colleges have failed to teach students how to think is revealed by the millions of dollars industry says it spends annually just to help students develop their thinking skills. Thinking can occur if educators become willing to make pedagogical changes and, perhaps just as important, become willing to be instructed in how to teach thinking.
CHAPTER 3
RESEARCH METHODS

This chapter presents methods which were used to analyze the writing of four prospective teacher education students in order to discover the types of thinking responses that were evoked from the writing. The students' writings were recorded in their course journals.

There are three sections to this chapter. Section I, Demographics, provides information about the college in which the participants are enrolled; the course from which the students were selected to participate; the subjects who served as participants in the study; the teacher researcher; and the setting. Section II, Means of Gathering Data, describes the writing assignments and how they were organized for analysis. Section III, Analysis of the Data, explains the procedures which were used to examine the writings for thinking skills.

Section I
Demographics

The Site
The study was conducted in a small state-supported college located in southern West Virginia. Enrollment at this institution for the 1990 spring semester was 2,441. Of these students, 281 (12 percent of the total enrollment) indicated their preference for a degree in teacher education. There were 183 of these students who indicated that they were pursuing the four year baccalaureate degree
in elementary education, while 98 students declared their preference for a variety of disciplines in secondary education.

This college was historically an all-black institution and was first integrated in 1955. However, it was not until 1966 that an effort was made by the college administration to fully integrate the school, both students and faculty. At the present time there are 207 (8 percent) black or other minority students and 2234 (92 percent) Caucasian students enrolled.

In 1969, dormitories were closed and were either demolished or converted into offices and classrooms. The West Virginia Board of Regents officially declared the institution a commuter college in 1970. With the removal of living quarters from the campus and the addition of off-campus sites and night classes, the college attracted more nontraditional students to its campus. At the present time (1990-91 school term), approximately 50 percent of the students are classified as nontraditional which means that they were nineteen years or older when they enrolled at a college.

The Subjects

The four participants in this study were prospective elementary teacher education majors who were enrolled in a reading methods course. All students in the class (twenty-seven) were given the opportunity to participate. Only one student did not wish to take part in the study, and during the semester, two students withdrew from the class because of work-related schedule conflicts. Two students, both males, were secondary education majors and were taking the course as an elective. Consequently, there were twenty-two students from which
to select the participants for the study, and near the end of the semester, four were chosen to participate.

A “Student Information Form” (see Appendix A) was used to identify the traditional students (eighteen years of age or younger upon entering college) and nontraditional students (nineteen years or older upon entering college). There were twelve traditional students (eleven females and one male) and fifteen nontraditional students (thirteen females and two males) in the class.

The college's office of the registrar, with permission from the Academic Dean's office, provided the cumulative GPA of the twenty-two students who had indicated their willingness to participate. This information would provide the necessary information for answering the research question which asked if there were differences in responses of traditional and nontraditional students with GPAs of A-B (4.0-3.0) and those with GPAs of C (2.9-2.0).

Students who had demonstrated enthusiasm in the content of the course through class discussions, collaborative group work, and my informal observations were considered as desirable candidates for the study. It is my belief that their enthusiasm would be conducive to more candid responses.

Two weeks before the end of the semester, I selected the four students to be the participants in the study. Two of these students (one traditional and one nontraditional) were from the group with a GPA of 4.0 to 3.0 (A or B average), and the other two (one traditional and one nontraditional) were from the group with a GPA of 2.9 to 2.0 (C average). For purposes of the study, fictitious names—Annette, Diana, Bertha, and Elena—were assigned to the students. Table 2 displays the four participating students' names and their grade point averages.
### TABLE 2

**PARTICIPATING STUDENTS**

<table>
<thead>
<tr>
<th>Name</th>
<th>T/NT</th>
<th>Age</th>
<th>GPA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annette</td>
<td>NT</td>
<td>30</td>
<td>3.78</td>
</tr>
<tr>
<td>Bertha</td>
<td>NT</td>
<td>42</td>
<td>2.12</td>
</tr>
<tr>
<td>Elena</td>
<td>T</td>
<td>21</td>
<td>2.58</td>
</tr>
<tr>
<td>Diana</td>
<td>T</td>
<td>20</td>
<td>3.35</td>
</tr>
</tbody>
</table>

*T - Traditional Student

*NT - Non-Traditional Student*
The Teacher-Researcher

I have taught the “Reading Process” course for the past five years and have had the freedom to experiment with a variety of techniques to conduct a more interesting class and to provide what I believe to be a profitable learning experience for my students. For the past three semesters the journal has become an integral part of the course. Up to that point, I had become increasingly aware of the hesitancy that students had shown about expressing themselves verbally and in writing. I had examined the “Writing to Read Program” for a possible research project and therefore had the opportunity to be associated with some of the public school primary teachers as they taught in that program. I observed the kindergarten and first grade children “write in journals” with computers as they worked in the “Writing to Read” laboratory, a computerized reading program. The program encourages students to learn to read by writing. Could there be a connection between writing and thinking? Journal writing would be a procedure for students to record their thoughts since journals are not graded, and this might alleviate a fear that so many students have about teachers “bleeding all over” their written assignments in the process of correcting and grading them. I had previously experienced journal writing in courses at VPI and SU and was familiar with its use. So, I made the decision to include journal writing as one of the requirements in the Reading Process course.

One of the students in the class wrote that she “was guilty at times” of being the type of student who “just wants to go to class, study, take a test, leave, and not bother with things like participating in any class discussions.” My concern was that students such as this person actually prefer to avoid thinking for themselves.
The journal was primarily to serve three purposes for the Reading Process course: to encourage students to express their feelings, their thoughts, their beliefs, to what they were learning; to help them think beyond memorization of facts (Bloom's lowest cognitive level); and to provide a channel for students (such as the one described above) to participate in class. The journal was a convenient way for students to organize information for the class and a means by which I might examine their writing for critical thinking skills which they might have used.

I analyzed the journal writings myself rather than solicit the help of colleagues, language arts specialists, or others because I knew each student personally, and I had worked with these students twice a week for the entire semester. Therefore, I felt that I was better qualified to analyze their writings more realistically than anyone else.

The Setting

The study took place in a reading methods class titled “Reading Process” that was offered twice a week for seventy-five minutes. The class met for thirty sessions throughout the semester. This is a three hour credit course and is the first in a sequence of three reading methods classes required of elementary education majors.

The course is quite comprehensive in what it proposes to do. The college catalog gives this course description: “Attention will be given to reading skills and concepts; and current practices in reading instruction for the early-middle grades” (Bluefield State College Catalog 1990-91, 152). The course was designed to familiarize students with the skills and concepts involved in the process of reading.

The course includes the following content: an understanding of the
relationship between word recognition and comprehension; strategies for
developing and extending vocabulary; understanding of language as a symbolic
system that represents concepts and feelings; dialect; understanding of the
development or oral language, reading, and writing; and an understanding of
literal and interpretive comprehension. The course schedule (see Appendix A)
presents topics which were covered in the course.

Students spent approximately 80 percent of class time working
collaboratively in brainstorming, reviewing, clarifying concepts, sharing ideas, and
completing written tasks. Lecture was utilized for introducing concepts, for
explaining, clarifying, and questioning. I attempted to create an informal, non-
threatening yet structured environment which I believe frees students to write.
Students comments assured me that the classroom environment was relaxed and
that they felt free to express themselves both verbally and in their writing.

Section II

Procedures for Gathering the Data

An interview with each of the four participating students was arranged
during the final weeks of the semester. A list of questions (see Appendix C,
Interview Questions) served the purpose of guiding the inquiries during the actual
interviews with the students. These interviews were helpful in obtaining an in-
depth and richer background knowledge of the participants' educational and
personal experiences, their interests, and their goals in life. This kind of
information would be helpful in understanding the participants and their responses
to the writing assignments. (Individual Case Studies in Chapter 4 discuss the
responses from these sessions.)
After the first two weeks of class, I collected the journals and wrote encouraging comments in them such as, "I enjoyed reading your version of that episode," "You are really applying your first-hand knowledge of children;" "Continue expressing yourself this way. You're doing great." Comments such as these were written to assure students that their journal entries would not be graded but that I would read each one and respond to their entries in a positive, constructive way. Copies of the six writing projects were made, and responses were read and reread. Their use of critical thinking skills were then placed on individual charts (Tables 3 through 10 in Chapter 4, "Use of Critical Thinking Skills in Assignments") to depict the kinds of thinking responses that each writing project elicited. Each table provides a list of the writing assignments and the four categories of critical thinking skills with each skill listed under the appropriate category. I developed a coding system for ease in examining and recording the skills. This coding system with the critical thinking categories and skills is as follows:

**ANALYZING ARGUMENTS/ISSUES**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DFQ</td>
<td>Defining or formulating a question</td>
</tr>
<tr>
<td>IDC</td>
<td>Identifying distinct components and terms</td>
</tr>
<tr>
<td>IWI</td>
<td>Identifying and working with irrelevancies as they appear</td>
</tr>
<tr>
<td>DIT</td>
<td>Define important terms</td>
</tr>
<tr>
<td>ISD</td>
<td>Identify similarities and differences</td>
</tr>
<tr>
<td>IAR</td>
<td>Identify assumptions and reasons, stated and unstated</td>
</tr>
</tbody>
</table>
### CLARIFYING INFORMATION

- **DCS**: Determining credibility of sources
- **DCI**: Determining consistency of information
- **RCB**: Recognizing bias
- **DFO**: Distinguishing between fact and opinion

### INFERRING

- **IEE**: Interpreting and explaining events and ideas
- **DCF**: Determining whether conclusions will follow from information given
- **GEI**: Generalizing events and ideas
- **DCE**: Drawing conclusions from events or ideas
- **DES**: Investigating by designing experiments, seeking evidence

### EVALUATING ARGUMENTS/ISSUES

- **JAI**: Judging accuracy and completion of ideas
- **JVI**: Judging the value of ideas and action
- **IRA**: Identifying reasonable alternatives
- **JES**: Judging effectiveness of specific and general strategies
- **JSW**: Judging issues that are strong and relevant or weak and irrelevant

Appendix D provides six tables of the four sets of students' responses to the writing assignments and a table depicting a total of each of the skills used for the six writing assignments is presented in Chapter 5.

The writing projects consisted of five strategies, and each strategy was used
to evoke critical thinking. The strategies were freewriting, dramatic scenarios, focusing, nutshelling, and dialogue. In a review of the kinds of strategies used in Writing-to-Learn projects, Anne Ruggles Gere (1985) describes these and several other strategies for encouraging students to write.

The first writing project was a freewriting exercise completed during the second week of class. Students wrote for ten minutes on what they could recall when they first learned to read and the situation under which their reading began. This activity was prepared merely to have students feel free of "product perfection" (Fulwiler 1980), i.e., of spelling, grammar, punctuation, form, diction, and style.

For the second writing exercise, a combination of nutshelling and dramatic scenario was used. Copies of an article, "The Nonconformist," were distributed, and students were instructed to read the hypothetical situation presented in the article and be able to tell the major problem presented in the story. The reading was to be done outside of class, and the writing was done during the next class session. Part I of this assignment asked students to explain the major problem in the situation. In Part II students were asked to analyze a first grade child's behavior but to do so as a parent or sibling.

Assignment three involved the students in a focused writing strategy for the purpose of encouraging them to concentrate on a single topic. This strategy enables students to determine how much they know about a subject. In this writing assignment students were asked to write an essay question for a mid-term examination for the Reading Process class. They were asked to answer their own question.

The fourth assignment asked the writer to project herself into the position of
a person who had done an excellent job of tutoring in a particular elementary
school. As a show of confidence in her performance, the principal had asked her
to return and teach a third grade reading class for one week. Students were asked
to determine what facts they should know about the class before accepting the
"reward." The two "dramatic scenarios" (assignments two and four) were devised
to evoke a diversity of thinking responses for the students.

Discussion groups were formed so that students could encourage each other
to express their views on the issues or problems given in the writing projects.
After brainstorming, students wrote their own responses in their journals. The fifth
and sixth writing projects were selected from these journal entries for the purpose
of examining their responses in collaborative group discussions.

Writing project five utilized the strategy of "nutshelling," described by Gere
(1985) and Flower (1981) as a technique that asks the writer to identify central
ideas in a given situation. This type of activity enables writers to select the most
important information from the article, a process that is essential to critical
thinking. "Clever Kanzi" is an article about an ape who is communicating with
humans in a laboratory setting. The writers were presented with a challenge of
deciding if the ape was learning a language.

The sixth assignment asked students to construct a dialogue between two
persons who are in the process of discussing or debating the issue of writing-to-
think. Moffett writes that the dialogue is concerned with "how to generate, clarify,
and order one's thoughts" and "deals splendidly with both reasoning and
fictionalizing..." (1981, p 49). Students were asked to brainstorm on the topic and
then write their dialogues.

All of the critical thinking skills (twenty) were used by the students, and a
variety of the sub-skills were discovered in their writings. Chapter 4 will discuss
these findings.

Section III

Procedures for Analyzing the Data

A coding system was devised for identifying the kinds of thinking responses used by the four students who served as participants in the study. The critical thinking skills used for this study were drawn primarily from Robert Ennis' *Goals for a Critical Thinking/Reasoning Curriculum* (1980, p 12-15). I merged Ennis' twelve categories into three broad categories and added Evaluation of Arguments/Issues to include skills of judging and evaluating. The four categories that were used are Analyzing Arguments/Issues, Clarifying Information, Inferring, and Evaluating Arguments/Issues.

The participants' writing assignment responses were read several times so that I could become more familiar with their writing style, i.e., use of vocabulary, sentence structure, and general use of the language. I found that I could identify their skills more readily if I examined one writing assignment from each participant before going on to the next writing. For example, I examined writing assignment one for all subjects before inspecting writing assignment two. Tables for each of the writing projects were constructed with students' names and each of the four categories of skills listed (see Appendix D for each of the tables and a copy of the writing assignment). Students' responses were entered on the table.

When reading the responses, I noted (in the margins of the journals) the categories and skills that the students used in responding to the arguments or issues. Appendix D presents a sample of one of Diana's writing assignments (assignment two) with the critical thinking skills noted in the margin. After the coding, students' critical thinking responses were placed under the corresponding
skill on the chart for that writing assignment. Each of the six writing assignments and students' critical thinking responses used for that assignment were coded and recorded in this manner.

A second reading with the examination of responses was conducted for verification of the critical thinking skills employed by the participants and some changes were made. Additionally, a table was constructed for each of the four participants to record the critical thinking skills used in each of the six writing assignments. This process allowed me to obtain a more workable definition of the critical thinking skills. By reading and re-reading students' responses, my ability to analyze the writing became more refined. Tables 3 through 10 in Chapter 4 depict the critical thinking skills used by the four participants.

Finally, all of the critical thinking responses of the four participants were charted to depict an overall summary of the use of each of the skills. In making a graphic representation of the critical thinking skills, I was able to examine the thinking skills used by students in completing the writing assignments.

The responses for each skill in each of the six writing projects were totaled to obtain the frequency of use of the skills by the participants. This data would produce information on the similarity of thinking responses of the traditional and nontraditional students as well as differences in the thinking responses evoked by each writing assignment.

The Case Studies presented each of the four critical thinking categories and their sub-skills which examined them for the number of times each skill was used and the context in which the skills were employed by each of the four participants. Data gathered from interviews will assist in providing a more complete portrait of each student. The case study method was used to describe
each student's critical thinking as completely as possible.

Chapter 5 presents a summary of the critical thinking skills used by the four students; similarities and differences in the responses of traditional and nontraditional students; the relationship between GPAs and the thinking skills used by the participants; and implications for education.

The methods I used for this study were designed to portray, as clearly as possible, the critical thinking skills used by the four students throughout the journal assignments.
CHAPTER 4

AN EXAMINATION OF FOUR COLLEGE STUDENTS' CRITICAL THINKING RESPONSES TO A SERIES OF WRITING ASSIGNMENTS

Case Studies:
Annette, Bertha, Elena, and Diana

Overview of Chapter

This chapter presents the results of an examination of the responses of the four participating students for the purpose of discovering the kinds of critical thinking skills which they used in the six writing assignments. An interview that I conducted with the four students at the completion of the course produced information about the students' friends, parents and siblings, educational experiences, goals, opinions about the writing assignments, and reactions to the Reading Process class. Results of the interviews are written into the "portraits" and the examination of the writing assignments.

Tables (4, 6, 8, and 10) depicting each participants' critical thinking responses to the writing assignments, are presented with the case studies. In the summaries of each case study Tables 3, 5, 7, 9, and 11 present a break-down of skills used in each writing project.
A Portrait of Annette

Annette, a thirty year old first-generation college student, i.e., the first in her family to enter a college, was born and raised in a small town in southern West Virginia with a brother who is sixteen years older than she.

Neither of Annette's parents completed high school. Her mother was the youngest of twelve children and did not finish junior high school because she was sick a great deal of time and her parents did not encourage her to go to school. Annette said that her mother "didn't really have an education, so she just never learned to read very well." Occasionally, however, she would tell Annette stories since she could not read them to her. Annette's father did not finish high school but went to work in the coal mines after he completed the tenth grade. She excused him for not reading to her as a child because "he was so quiet."

She spoke at length about her first grade teacher who she said was her inspiration for wanting to become a teacher. She was impressed with the kindness of this teacher and her desire to make students feel at ease in her classroom. Annette told of this teacher who comforted children when they cried or when they were upset about something that had occurred at home or at school. The teacher would hold the child in her lap until the tears ceased. "She made sure that she listened to what each child had to say."

Her junior high school building "was always dirty, and still is." Many of the teachers in that school showed little interest in their students. In high school Annette was in the business curriculum and stated that she had not been required to write an essay until she started to college: "I guess it was just not required in the business track." However, Annette hastened to mention that she was an active
member of her high school honor society.

Because she was not required to take algebra or advanced mathematics in high school, Annette said that she scored very low on the mathematics portion of the American College Testing scale. Therefore, she was required to pass a developmental mathematics course in college before she could enroll in other mathematics courses.

Annette did not seem to resent the little time her mother spent with her as a child because she said that her parents were “old-fashioned” and believed that “children should be seen and not heard...sort of...because they were loving and kind to me and did listen when I wanted to tell them something.” She spoke with respect about her parents and was protective and defensive of their ideas on parenting. Neither of her parents encouraged her to read or study. They did not want her to go to college because if she went away from home, she “might get into some kind of trouble.” Her mother wanted her to get a job and stay home even though she had been accepted by a university in West Virginia and had enrolled in classes there. She “didn’t want to worry Mom,” so she got a job working as a cashier in a grocery store near her home.

She did not stay long at the grocery store job because she married her childhood sweetheart at the age of twenty. Her husband worked two years in the mines after they were married but was “laid off” and decided to go to college. He had been taking evening courses at a college extension center located nearby. He completed work on a degree in physical education and began teaching at the same high school which they both had attended. He has remained in that school but told Annette that the work is “so negative and unchallenging.” Consequently,
they plan to leave West Virginia and move to Virginia when she receives her teaching degree.

Annette took business courses at the same extension center as her husband but did not feel challenged in that field of study, so she dropped out of college and went to work in a bank. She worked as a teller in the bank for six years but gave up that job to return to college. She attended classes two days a week on the main campus of the college, a two-hour drive from her home. In 1990, her two sons were six and eight years old, and since she felt that they were “old enough” for her to be away from them for longer periods of time, she became a full-time student. She enrolled in the elementary education program with a concentration in special education.

She made the decision to pursue a degree in education because she “was not doing what she really wanted to do.” She said, “I thought that I wanted to study business, but in that field I wasn’t doing anything that was important.” If I had to work, I was going to do what I wanted to do.” At that time, she was working at the bank while she took business courses in the evenings.

Annette was a pleasant, soft-spoken student who sat in class near the same group with whom she commuted to college each day. She wrote in her journal that she enjoyed meeting other members of the reading methods course. During collaborative group work she seemed to take the lead in getting the group discussions started. When students selected their own partners or group members she would move away from her “commuter buddies” to be part of another group.

On three separate occasions, Annette wrote that it was difficult for her to write because she could not concentrate. On one occasion her father-in-law had had a heart attack and was in the hospital. She spent the night there and drove

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directly to the college from the hospital. Another time, her son was ill, and she wrote that leaving him home with a sitter was difficult for her to do. The third occasion in which she had difficulty concentrating on classwork was a few days before spring break and she planned to spend a relaxing week with her husband and sons. She wrote, “Even though they were at school, I felt good being there for them.” Annette, as stated earlier, has a very close relationship with her family, and I think she feels a bit uneasy when she is not there at all times with them.

Frequently, Annette spoke and wrote about her children and would find a way to relate what was happening to them at school or at home with the topic for the day. In one instance, she spoke of her husband becoming irritated with their six year old’s recitation of rhyming verses. He asked why children had to learn these verses. She said, “I felt great telling him that I knew why—he’s developing auditory discrimination skills!” She also wrote that she had learned a variety of methods for helping her sons with their reading comprehension problems.

An entry in Annette’s journal described how she felt relaxed and free to talk and write openly in the Reading Process class. She said that the writing assignment made her “start to think and reason things out.” The problem solving strategy (advocated by Wales, et. al.) which was introduced to the students in March seemed to be helpful to Annette. She said that she had used the technique in the writing assignment which asked students to construct a dialogue. She wrote, “I was so proud when I finished, I felt I could accomplish anything. Thanks for the help.”

The collaborative group activities in class were beneficial to her, she said, “I feel relaxed, not threatened, because if I’m not sure of something, there’s always someone in the group who can help. And there are times when I can help others
in my group.”

In retrospect she feels cheated out of a good education because she was not encouraged to learn in school nor was she encouraged to read or study at home. However, at this point Annette has achieved an overall grade point average of 3.8 in her college courses. Now she says, “I look forward to buying a home, moving out of the trailer, teaching, and making my family happy.”

An Examination of Annette’s Critical Thinking
Responses to Six Writing Assignments

Annette’s Critical Thinking Responses to
Writing Assignment 1

The critical thinking skills used by Annette in the six writing assignments are depicted in Table 3. The first writing assignment posed the problem: Write what you can recall about when you learned to read. Include the situation under which your reading began and tell why you wanted to learn to read. Annette wrote, “I don’t remember not being able to read.” This was a ten minute freewriting exercise and she began by writing about learning phonics and the alphabet in school. She did not write about actually reading to her parents, only that she would rush home from school to tell her mother what she had learned. In an interview with Annette, she explained that her mother did not have an adequate education and therefore could not read to her.

Annette’s first critical thinking response in writing assignment one was in the category of inferring. She attempted to explain the events that led to her learning to read. From the beginning of the writing she appeared to be searching her mind for answers. “I would be very excited about what I had learned at
### TABLE 3
Annette's Critical Thinking Responses
to Six Writing Assignments

<table>
<thead>
<tr>
<th>Writing Assignments</th>
<th>Analyzing Arguments</th>
<th>Clarifying Information</th>
<th>Inferring</th>
<th>Evaluating Arguments</th>
<th>Total of Skills Used</th>
</tr>
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<td>1 January 31</td>
<td>X X</td>
<td></td>
<td>X X X X X</td>
<td>X X</td>
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</tr>
<tr>
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<td>X X</td>
<td></td>
<td>X X X X X</td>
<td>X X</td>
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<td>3 March 19</td>
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<td></td>
<td>X X X X X</td>
<td>X X</td>
<td>9</td>
</tr>
<tr>
<td>4 April 30</td>
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<td></td>
<td>X X X X X</td>
<td>X</td>
<td>7</td>
</tr>
<tr>
<td>5 March 7</td>
<td>X X</td>
<td></td>
<td>X X X X X</td>
<td>X</td>
<td>13</td>
</tr>
<tr>
<td>6 April 9</td>
<td>X X</td>
<td></td>
<td>X X X X X</td>
<td>X X</td>
<td>12</td>
</tr>
</tbody>
</table>

Critical Thinking Skills

| Critical Thinking Skills | DFO | IDC | IMT | ISD | IDT | IAR | OCS | DCI | DCB | OFQ | IEE | DCF | DCF | DOE | DCE | DES | JAL | JVI | IRA | JES | JSW |
|--------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Total Critical Thinking Skills Used | 6 5 2 0 2 3 1 3 1 5 2 6 4 5 1 5 4 4 2 | 62 |
| Total Skills for Each Category | 18 | 6 | 22 | 16 |
school”; “I would read the new words to my dolls”; and “I don’t remember not being able to read.”

Annette used the following critical thinking skills in her search for an answer to the question: defining or formulating a question; identifying distinct components; determining consistency of information; interpreting and explaining events and ideas; generalizing events and ideas; drawing conclusions from events or ideas; investigating by seeking evidence; judging the value of ideas and actions; identifying reasonable alternatives; and judging effectiveness of specific and general strategies. At the completion of the first writing assignment, Annette wrote her own question: “When did I learn to read?” As she wrote, Annette was generating information from her past experiences (long-term information). This freewriting exercise allowed her that freedom. She sorted through her experiences, seeking, as Britton (1983) described the process, significant information. Annette’s responses to this assignment were good examples of Britton’s explanation.

Annette’s Critical Thinking Responses to Writing Assignment 2

In the first part of this writing project, a “nutshelling” activity, the writers were asked to state what they believed was the major problem addressed in the article, “The Nonconformist.” Nutshelling is a writing strategy in which the writer is asked to identify the central idea in the information given. Flower (1985) claims that this process of selection is essential to critical thinking. The situation in the article is a hypothetical one involving a first grade child as she tried to cope with free time before and after her reading group completed their session with the
teacher, Ms. Snyder.

Annette approached the problem with, "I think the main problem is no approval of anything that Wendy or the others in the classroom does." She continued, "Everything they hear is negative and there is no reinforcement for the good things." Her writing was rich in "conversational language" (Fulwiler 1987), using contractions and first person pronouns. This was prevalent in the first part of the problem.

Part two of this assignment asked the students to participate in a dramatic scenario by posing this situation: "Now imagine yourself as a member of Wendy's immediate family, and analyze Wendy's behavior as you arrive to take her home from school." Annette did not write as if she were family but wrote, "I think if I were Wendy's mother I would have been puzzled"; and "Her mother would probably want to spank her at first." Annette may not have read the question carefully, or perhaps she chose not to role-play in responding to the situation. She wrote of how Wendy might have felt, "She didn't feel good about herself at the end of the day;" "She probably felt...that is why she yelled at her mother;" and "Why not? That is what she had heard all day from the teacher." Once she identified the problem, Annette began making inferences and judgements, perhaps in an attempt to evaluate the problem situation.

Annette used four inference skills in an attempt to synthesize and evaluate the information gathered in her interpretation: interpreting events and ideas; generalizing events and ideas; drawing conclusions from events; and seeking evidence or explanations. Her explanations included: "She seems like the type of teacher who just complains all day about the children;" and, "Probably, the only reinforcement she got was when she did something wrong."
In the category of Evaluation of Arguments, Annette judged the value of the teacher's actions by writing that the teacher did not leave room for creativity and exploration in her classroom. The critical thinking skill of using an alternative in handling a situation occurred when Annette told of how she would have handled the problem of Wendy coloring an umbrella purple when the directions instructed her to color it green. She wrote that the teacher could have said, "The umbrella does look pretty colored purple but let's color a green one now. Point to the word 'green'."

Annette used four of the critical thinking skills of Evaluation of Issues in this writing exercise. She judged the value of ideas and actions; identified reasonable alternatives; judged the effectiveness of specific and general strategies; and judged issues that were strong and relevant. She did not use the Clarifying skills because she responded quite literally to the questions as if everything in the article was true. Therefore, she found no reason for clarifying the information.

Annette's Critical Thinking Responses to Writing Assignment 3

This writing exercise asked the students to write a mid-term examination essay question for the Reading Process course and to answer their own questions. This activity was a focusing strategy which would enable students to recognize how much they knew about a subject. They were allowed fifteen minutes to complete the assignment, focusing their attention on constructing and answering the question.

Annette's essay question was: "Discuss two approaches to teaching beginning reading and tell which one you prefer." She used nine of the critical
thinking skills in responding to her question.

The top-down and bottom-up approaches (theories) were the answers Annette used. In response to her question she wrote that she would prefer the top-down approach because in this theory, students are more involved in their own learning. In describing the top-down approach, she quoted Roach Van Allen, “What I can think about, I can say. What I can say, I can write. What I can write, I can read. I can read what I write and what other people have written for me to read.” Annette explained, “The Language Experience Approach is a type of top-down theory where the child uses what is familiar to him and his language, making the story have more meaning to him.” This assignment called for the use of a focused writing strategy, described by Gere (1983) as one which invites students to concentrate on a single topic. Gere believes that this strategy enables students to “see how much they know” about a subject.

Annette used three each of the Analysis, Inference, and Evaluating skills in her responses but did not use any of the Clarifying skills. She formulated the question, explained and generalized her ideas of the two approaches and identified the components of the approaches with their likenesses and differences. Annette attempted throughout her essay to explain her responses. In evaluating the approaches, she was definite that she would prefer the top-down approach because children would not become bored with reading but would want to continue reading. Annette wrote, “This is an important part of reading, having students motivated to want to read.”

Annette added a post script to her responses. She wrote that so much had been done in class that day that “time flew by, but it was so hard for me to concentrate on the writing assignment today because I kept thinking about spring
break in just three more days!” I believe she offered this as an excuse for her limited responses to the problem.

**Annette’s Critical Thinking Responses to Writing Assignment 4**

For this writing assignment, the student was given a situation in which the principal of an elementary school was inviting her to teach a third grade reading class for one week. Hypothetically, the student had tutored some students at that school previously and the principal was pleased with her work. The question asked what important facts about the situation would the student need to consider before accepting the invitation.

This project was a dramatic scenario, described by Anne Gere (1985) as a situation of conflict which is drawn from subject matter. In this strategy, the writer is asked to project herself into the situation. Annette started her writing with this statement, “The first fact I would need to know would be how many children were in the class.” The theme throughout her writing was that of individualizing instruction, of getting to know each child, and of selecting “material appropriate for my class, their ages and interests.”

In her responses Annette used inference skills more often that the other critical thinking skills. She was more interested in knowing more about the children’s background than the reading aspects of the problem. One of Annette’s written responses was, “It would help if I knew what ways of learning were most comfortable for them because the best way to teach children is to understand them individually, by being familiar with these characteristics.” The characteristics she
wrote about were concerned with children's learning styles, their interests, their abilities, and their family backgrounds. She used seven of the twenty sub-skills in this assignment: formulating questions, identifying distinct components; interpreting and explaining events and ideas; determining whether conclusions follow from information given; generalizing events and ideas; investigating by seeking evidence; and identifying reasonable alternatives. This assignment elicited the least number of critical thinking responses from Annette than the other five writing assignments.

Annette's arguments were strong and well stated. Her last response in this assignment was: “If the choice of material was left up to me, I would select material appropriate for my class, their age, and their interests.” However, she apparently saw no need to use the Evaluation skills to examine the important facts one would need to know before agreeing to teach the class. Annette did use the skill of seeking a reasonable alternative when she stated that she would select appropriate material for the students instead of having someone else do that for her.

Annette's Critical Thinking Responses to Writing Assignment 5

"Clever Kanzi" was a short article taken from Discover magazine and dealt with the question of whether an ape can learn a human language. The question posed to the students was: From what you have read in this article and based on your knowledge of language development, do you believe that Kanzi was mastering the human language? Explain your answer.

Annette wrote, "Today had to be one of the most interesting and unusual
classes we have had.” She went on to identify the problem and questioned the whole issue. Although Kanzi could understand “certain things” and could communicate to a “certain degree,” she would have to agree with Noam Chomsky that it would be somewhat of a miracle if the animal had such a capacity and had not used it until now. In relating the irrelevancies and assumptions, Annette used Chomsky as a source of credibility.

The assignment to read the article and the questions was given at the beginning of the class. Students were allowed ten minutes to read the one page article and were then placed in groups of five to answer the questions. Annette was placed in a group with two nontraditional students who had been reluctant to express themselves. One student had been a very quiet person at the beginning of the semester but was now anxious to respond in class discussions. The fifth member of the group, a traditional student, remained timid and withdrawn in this activity and throughout the semester. Needless to say, Annette’s group was a diverse one, and even the quiet ones were speaking their opinions before the discussion was completed. Annette had little to say in the group and merely listened to what others were saying. The groups met for thirteen minutes; then a spokesperson reported what their group had concluded. Annette, seemingly irritated by the arguing within her group, had this to say, “I think some people in the class really love their pets, and they don’t want to sound negative about animals. I really don’t think they honestly believe that their pets have a language. I hope not anyway!”

This writing activity was called nutshelling because it asked the writer to identify the central ideas in the issue. Annette employed thirteen of the twenty critical thinking skills in her written responses to this issue. This assignment
elicited more critical thinking skills than the other assignments. She used all of the clarifying skills as she analyzed the situation. Annette appeared to be seeking answers by clarifying the given information. This was also one of her favorite assignments as she was familiar with language development concepts–she wrote of Kanzi’s ability to understand some words and how they were related to his experiences in the laboratory. The skills used were: defining the question; identifying and working with irrelevancies as they appeared; identify assumptions and reasons, stated and unstated; determining credibility of sources, determining consistency of information; recognizing bias; distinguishing between fact and opinion; interpreting and explaining events and ideas; determining whether conclusions follow from information given; generalizing events and ideas; drawing conclusions from events and ideas; judging accuracy of ideas; and judging the value of ideas and actions.

Annette’s Critical Thinking Responses to Writing Assignment 6

The sixth assignment used for examining students’ thinking, was a dialogue. It invited students to construct a dialogue between two elementary teachers in which the concept of writing to learn and think was being discussed or debated.

Each student selected a person to confer with in responding to the problem. Annette selected Betsy, one of the persons in a previous group who was adamant in the argument about animals mastering the human language (writing assignment five). Betsy was a student in the class who would consistently take the most controversial side of an issue in class discussions. Annette wrote that she selected Betsy as a partner “just as a challenge.”
Their dialogue began with Annette asking Betsy what she thought about writing to learn and the top-down approach to teaching reading. Annette immediately formulated a question to begin the dialogue: “What do you think of using the top-down approach to teaching beginning reading instead of the bottom-up approach?” In response to Annette’s question, Betsy said, “I don’t approve of using one approach at a time. In my opinion, a combination of these two approaches should be used in the classroom.” The dialogue continued with the two approaches used as a means of discussing the writing to learn and think concept. Betsy told Annette that students need to master the skills of reading while they were learning to think and write. Betsy continued her argument with a claim that “in certain situations, such as tests and essays, you have to have only one answer.” Annette argued that the top-down approach encourages divergent thinking and stimulates students to think and be aware of more than one right answer.

This strategy is a variation of Moffett’s (1981) dialogue (he suggested that the dialogue be done by one person). In this activity, two people are actually writing the script. They were allowed fifteen minutes for writing their dialogue.

Annette used one critical thinking skill from the category of Clarifying Information and that was judging the consistency of information. She had difficulty pointing out to her partner that the top-down approach allowed for more diverse thinking since her partner was obstinate in her view that reading skills should be mastered before students can write. But Betsy finally conceded, in part, when she wrote, “All right, I will agree that we need to teach children to think at an early age, but I’m not sure how we can do that.” Annette concluded: “I feel that the top-down approach is the best approach to start young children writing,
thinking and learning."

Annette used these Inference skills: generalizing events and ideas; drawing conclusions from ideas; and investigating by seeking evidence. She used three of the Evaluating skills: judging the value of ideas; judging effectiveness of general strategies; and finally in questioning Betsy, she used the critical thinking skill, judging issues that are strong and relevant. Five of the Analyzing skills were used and one Clarifying skill. A total of twelve critical thinking skills were used by Annette in this assignment.

In the interview Annette stated that this activity was not fun because she "didn't know where to go with it," that she was not sure in which direction she was going. This exercise presented a cognitive dissonance for her, but as I explained to her, this was necessary to critically analyze the concept of writing to think and learn. It is my belief that Annette understood the concept better than she realized. She consistently interjected various aspects of reading into her responses.

A Summary of Annette's Critical Thinking Responses to the Six Writing Assignments

Annette used a total of sixty-two critical thinking skills in her responses to the six writing assignments. These responses made up approximately 52 percent of the possible 120 critical thinking skills. She used more Inferential skills than she did the other four categories of skills. Table 4, which was drawn from Table 3, lists the skills and the frequency with which each skill was used in the six writing assignments. She used eighteen critical thinking responses in the Analyzing category and sixteen responses in the Evaluating category.
<table>
<thead>
<tr>
<th>Analyzing</th>
<th>Assignments</th>
<th>Number of Times Used</th>
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</thead>
<tbody>
<tr>
<td><strong>Analyzing</strong></td>
<td></td>
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<tr>
<td>Forming Questions</td>
<td>1, 2, 3, 4, 5, 6</td>
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<td>Identify Components</td>
<td>1, 2, 3, 4, 6</td>
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<td>Identify Irrelevancies</td>
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<td>Define Terms</td>
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<td>Identify Similarities</td>
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<tr>
<td>Identify Assumptions</td>
<td>2, 5, 6</td>
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<td>Determining Consistency</td>
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<tr>
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<tr>
<td><strong>Inferring</strong></td>
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<tr>
<td>Interpreting</td>
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<td>Conclusions Follow</td>
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<td>Drawing Conclusions</td>
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<td><strong>Total</strong></td>
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After examining all of Annette's writing assignments for critical thinking responses, I discovered that she had used more of the skills in assignment five (March 7), the nutshelling activity, which questioned the possibility of an ape learning a human language. She wrote, "This had to be one of the most interesting and unusual classes we have had," and although she wrote only one and one-half pages for this assignment, she responded more precisely than she had done in the other writing assignments.

Assignment 6 was her least favorite writing activity, yet it evoked twelve of twenty critical thinking skills. In this project she utilized more of the analytic skills than she had done in the other writing projects. It is possible that in these two projects she was assisted or provoked by her peers into thinking critically. Both of these assignments were completed in a collaborative/cooperative work situation.

Assignment 4 (April 30) evoked only seven critical thinking responses in Annette's writing. In examining her responses to this assignment a number of times, I have concluded that she allowed herself to become bogged down in the concept of "individualizing instruction" and was unable to proceed beyond that point.

Annette seems to be in Position 3 of Perry's Scheme of Cognitive Growth (1968, revised 1981), "Multiplicity Legitimate but Subordinate," because she recognizes uncertainty as temporary and diversity of opinions as temporary but legitimate. An example of her position is found in assignment five. Here she recognized the diversity of opinions in her group but concluded that she didn't believe members of her group believed that their pets had a language, at least she hoped not.
In conclusion, Annette was pleased with the journal writing assignments and said, "The journal writing assignments required you to think, and I believe that was one of the strengths of this class."
A Portrait of Bertha

Bertha is a nontraditional, African-American student from a southern West Virginia county. She has lived in the same county for her forty-two years of life where she was next to the youngest in a family of five children. Her parents have been deceased for fifteen years.

She told me in the interview that her mother was always her best friend to whom she could talk about “personal things, like hygiene, boys, and just about everything.” Bertha’s mother quit attending school during the eighth grade, and in her words she said, “My mother was functionally illiterate. I know that now since we discussed things like that in this class.” Her father read newspapers and magazines but did not read to the children. He had attended a business college in Georgia, but, Bertha said, “That was during the time when it was real, real hard for blacks to get good jobs, you know, so he had to go to work in the coal mines.” He worked in the coal mines for fifteen years but developed “Black Lung” (silicosis) and was unable to continue working at any job. Bertha remembered that her father talked about college to the children, and she wanted to attend college someday.

Bertha recalled that as a child she could “hardly read at all, because I always had a problem with reading. I could read…but I didn’t comprehend anything.” Her sister who was eight years older than she, read to her, but Bertha could only remember two books, Little Red Riding Hood and The Three Little Pigs, because they only had a few books at home.

Bertha sadly reflected on her experiences in elementary school which were marked by prejudices within her own race. Her teachers, she felt, discriminated
against her because she was a slow learner. She recalled being placed in another classroom with nine or ten other students who were all but ignored by the teachers. She declared that, "Basically, everything we had to do, we put it on the board and the kids in the higher groups would give us help. But they did everything for us and they never did give us much time to analyze, you know, figure things out by ourselves. I think that kind of hindered me in learning a lot." Bertha continued, "They were nice to me, I just didn't...or maybe...I don't know...maybe I just couldn't learn anything."

Bertha declared that a turning point in her ability to read occurred when she was thirteen years old and she had to read the directions for adjusting her father's portable oxygen tank. She was unable to read and comprehend the written instructions for setting the meter on the tank. A more detailed description of this episode is reported in "Bertha's Responses to Writing Assignment 1."

Needless to say junior high school work was far too difficult for Bertha since she did not have the background knowledge in mathematics and reading. She said, "I don't know why they put me in algebra when I didn't have any math skills." When asked if the teachers helped her or left her on her own, her response was, "No, no, no...generally they would review, and I would get some of my friends and they would explain things to me...." Bertha mentioned two teachers who helped her study for tests during free time, that they would "go over stuff" with her. As noted from her reactions to my questions, Bertha was defensive of her teachers and said, "All my teachers were black and they really tried to help me with my school work. It's just that tests were always difficult for me and they still are."
“High school was just as bad,” she said. “I don’t know how I ever got out of there because I couldn’t do a lot of the reading and writing assignments they gave us.” Consequently, Bertha was ill-prepared for college and the demands that were placed on her to read and write. Upon entering college, she was placed in developmental mathematics, developmental reading, and developmental English classes and still finds it difficult to keep up with the work. Bertha admitted that mathematics was her problem now but sincerely believes she can overcome this weakness so that she can pass the tests that are required for admittance to the teacher education program.

Bertha credited her girl friends in high school for helping her with school work and teaching her how to read. She received a certificate of graduation from high school but did not receive a diploma. So after graduation, she took instructions for the General Education Development (GED) tests and successfully passed the three areas necessary for acquiring a high school equivalency diploma. Bertha said, “I always doubted myself in school; but after I got my GED, I started in a two-year business school, but I couldn’t learn the typing skills.” Later, Bertha worked as a nurse’s aide at two different hospitals near her home, but she had to quit her job and care for her ailing parents.

Bertha has been married thirteen years and has four children ages twenty-four, twenty-one, fifteen, and nine. Her husband, who is now fifty-five years old, was employed as a coal miner by a coal company in the county in which they now reside, but he was injured in a slate fall in the mines and is physically disabled. He has been disabled for eight years, so he collects disability checks, cleans the house and goes back and forth to doctors for treatment of a punctured lung as a result of the mining accident.
Bertha has friends with whom she commutes to the college each day. Her best friends, however, are ministers and “church people” who are married. They attend church together, have picnics, and talk on the phone about their children. Bertha prefers having married friends, she explained, “...because...because, I guess it looks better.”

Bertha’s primary goal, she contends, is “to get a four-year degree in LD (learning disabilities), and after I do that and work a while, I would like to get my Master’s Degree.” She feels that she could contribute a great deal to “LD kids” because she hopes to be an example for them, that if one works hard enough her dream can come true. Bertha has strong feelings that special education students should be placed in regular classrooms so that they can learn how to “deal with other people...pick up their language...language skills and study habits. They might not become A students, but it would help them,” she declared.

Her favorite writing activity was writing assignment six (constructing dialogue with a partner) because she believed it to be the most challenging one. Bertha did not have to read in this activity and worked with another student. This situation allowed her to talk and to listen to another person’s responses—something she had leaned to do in her public school experience. She and her partner brainstormed several ideas but combining these ideas and writing them was the challenging part, Bertha said. She admitted that the article about the nonconforming child was the most difficult because she said, “You had to put yourself in position to really see how she felt and why. Wendy wanted to do everything her way.”

Bertha insisted that the Reading Process class had been the only course that she has taken that allowed her the opportunity to express herself and explain her
feelings. She said that she had tried to analyze her family problems as well as problems in her other courses as a result of her “thinking experiences” in the reading class. Bertha confided, “I write my problems down on paper, and then I read them to see can I figure out how to solve them.”

An Examination of Bertha’s Critical Thinking Responses to Six Writing Assignments

Each writing assignment with the critical thinking skills used by Bertha are depicted in Table 5. Each writing assignment, with the skills used in that writing, are noted on the chart.

Bertha’s Critical Thinking Responses to Writing Assignment 1

The first writing assignment asked students to write what they could recall about when they learned to read and to include the situation under which their reading began. Bertha wrote four pages in responding to this ten minute freewriting activity. She began by recalling her sister reading her a story which she had read to her on numerous occasions. This time was different, “it was as though I was reading along with her.” This was a book that her sister had used to teach her to say the words and she believes that this was the beginning of her reading. However, Bertha was to learn later that she has great difficulty with comprehending what she sees on the printed page.

Bertha wrote a frightening tale of when she was thirteen years old and unable to read well enough to comprehend. Her father was on medication, and at times, had to be placed on a portable oxygen machine which was kept at home.
TABLE 5
Bertha's Critical Thinking Responses to Six Writing Assignments

<table>
<thead>
<tr>
<th>Writing Assignments</th>
<th>Analyzing Arguments</th>
<th>Clarifying Information</th>
<th>Inferring</th>
<th>Evaluating Arguments</th>
<th>Total of Skills Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 January 31</td>
<td>Recall learning to read (Freewriting)</td>
<td>X X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>2 February 26</td>
<td>Nonconformist (Nutshelling &amp; Dramatic Scenario)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>3 March 19</td>
<td>Mid-term Exam Question/Answer (Focused Writing)</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 April 30</td>
<td>Teaching Reading for One Week (Dramatic Scenarios)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>5 March 7</td>
<td>Kanzi - Language (Nutshelling)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>6 April 9</td>
<td>Dialogue - Writing to Think (Dialogue)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Critical Thinking Skills</th>
<th>DFG</th>
<th>IDC</th>
<th>NW</th>
<th>DT</th>
<th>ISD</th>
<th>JAR</th>
<th>DCS</th>
<th>DGI</th>
<th>RCB</th>
<th>DFO</th>
<th>IEE</th>
<th>DCF</th>
<th>GEB</th>
<th>DCB</th>
<th>DES</th>
<th>JAN</th>
<th>JVI</th>
<th>IRA</th>
<th>JES</th>
<th>JSW</th>
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<tbody>
<tr>
<td>Total Critical Thinking Skills Used</td>
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<td>3</td>
<td>0</td>
<td>1</td>
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<td>2</td>
<td>1</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Total Skills for Each Category</td>
<td>13</td>
<td>3</td>
<td>11</td>
<td>5</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
On this occasion he became ill and was breathing abnormally. He needed to be placed on the oxygen machine but none of her brothers or sisters, who usually operated the machine, was at home. If the meter were not set at a specific amount, serious damage to the heart and lungs could occur. The pamphlet with instructions for operating the unit had been underlined and the page marked by her sister. Since her mother was illiterate, the task of reading and following instructions was left to Bertha. She had a great deal of difficulty in trying to translate the directions, but she did set the meter and called the hospital and the rescue squad. Her father was taken to the hospital, alive, but very ill.

Although Bertha said she had made up her mind to “try harder to read and comprehend everything,” she had fallen so far behind in school that she found it very difficult to keep up with the work. But there were two special teachers who worked with her anytime she asked for help. This help, she recalled, was usually reviewing for tests.

Bertha’s vivid recollection of the consequences of her inability to read well enough (at the age of thirteen) to follow directions had made a lasting impression in her memory (long-term memory [Flower 1981]). She met the challenge of recalling and writing freely about her beginning reading with ease. She told me in the interview that, “I felt better after telling you about that terrible experience. But I don’t feel guilty.” Bertha used more critical thinking skills in responding to this assignment than she did in the other five writings.

In the category of Analyzing Arguments, Bertha used the critical thinking skills of defining the question, identifying distinct components, and identifying reasons. In the area of Clarifying Information, she used the critical thinking skill,
determining the consistency of information. The Inference skills of interpreting and explaining events, drawing conclusions, generalizing events and ideas, and investigating by seeking evidence were used in her responses.

Bertha employed the Evaluating skills of judging the value of ideas and actions when she wrote of her mother's lack of ability to read and of her own weaknesses in reading. She also used the skill of judging the effectiveness of general strategies when she wrote of the methods that some of her teachers used to teach her to read. A total of ten critical thinking skills was evoked by this writing assignment.

**Bertha's Critical Thinking Responses to Writing Assignment 2**

The second writing project, a combination of the strategies of nutshelling and dramatic scenario, was the most challenging of the assignments for Bertha. Taking on the role of another person was difficult for her, she said.

In the first part of the project, students were asked to identify the major problem in the article, "The Nonconformist," and to explain the classroom situation. Bertha perceived the problem to be "the environment" in the classroom, but she did not explain "environment." She stated that the teacher wanted to be in charge, and Wendy should have complied with the rules instead of "defying authority." In this instance, Bertha attempted to answer the question but did not identify the components of the issue. She used one of the Inferring skills (generalizing ideas and events) which could have been done by simply skimming the article.

Bertha presented little evidence that she was familiar with the entire article.
Because she has had problems with comprehension in the past, it is possible that Bertha had difficulty in reading or completing the reading of the four and one-half page article. The assignment to read the article was to have been done outside of class which might have presented a problem for her. There might not have been anyone to help her in translating or discussing the article.

In the role-playing (dramatic scenario) part of this question (Part II), Bertha wrote in terms of her own experiences as a parent. For example, she said, “I feel that the child should be taught at home to act and be patient in any given situation.” From her responses in this writing assignment, Bertha seems to fall into Position 1 (Basic Duality) of Perry’s scheme of cognitive development, “obedience is the way.”

Flower and Hayes (1981) found that if the writer’s representation of the rhetorical problem was inaccurate or underdeveloped, the writer is not likely to solve or attend to the missing aspects of the problem. In analyzing her responses, I found that this was part of Bertha’s problem; she clearly had an inaccurate and underdeveloped concept of the rhetorical problem. She was unable to explain the problems or to interpret the classroom situation. Simply stated, the challenge was more than Bertha could manage.

Bertha was given credit for using the critical thinking skills of defining the question, identifying similarities and differences, and generalizing events and ideas. She used a total of three out of a possible twenty critical thinking skills in this writing assignment.
Bertha’s Critical Thinking Responses to Writing Assignment 3

The third writing assignment was a focused writing exercise. I presented the problem to the students and allowed them fifteen minutes to write their responses. The assignment was that students write an essay question for the course, Reading Process, and to answer their own question. Bertha posed this question: “What is language development?” She was using the critical thinking skill of formulating a question. Bertha made an attempt to identify distinct components of the issue but drifted into the concept of communication and got tangled up in terminology. She said, “There are more steps in language development such as likenesses and differences, opposites, the ability of a person to be able to polarity, categorizing, able to group objects on the basis of defined.” I did not fully understand what Bertha was saying. I believe that she was writing words, terms, and concepts that she had heard during discussions or that she had read in the textbook and handouts on the topic of language development, but apparently she did not comprehend the terminology. I found this a common occurrence in Bertha’s writing for this assignment. She wrote words or terms of which she apparently had limited knowledge. For example, she wrote, “...to be able to polarity...” and “...group objects on the basis of defined.” The use of such phrases or words would make no sense to someone who read her writing. Flower and Hayes (1981) wrote that when writing is incoherent, it is possible that the text might have failed to consolidate new ideas with earlier ideas. In Bertha’s case, I believe this was the problem; she did not have the knowledge base with which to “consolidate” new ideas. She initiated a question that was too difficult for her knowledge base.
This was Bertha’s weakest set of responses from the six writing assignments. This strategy required the writers to concentrate on a single topic for fifteen minutes and which would enable them to see how much they know about the topic. After rereading the transcript of the interview which I had with her, I discovered that Bertha was unaware that she had a problem with this project. The journal entry written one week after this writing assignment read, “I think I wrote a good essay question and answer, at least I hope I did.” Bertha used two critical thinking skills in her responses, formulating a question and determining whether conclusions follow from information given. The challenge of writing and answering her own essay question was more difficult than Bertha perceived it to be.

Bertha’s Critical Thinking Responses to Writing Assignment 4

This writing project was another dramatic scenario in which the writer was told that she had been selected by the principal of an elementary school to teach a third grade reading class for one week as a show of confidence in her performance as a tutor at the school. The writer was asked, “What important facts about this situation need to be considered before you agree to teach this class?”

Bertha wrote five questions in response to the situation. Her first question was, “What type of school environment will I be surrounded with?” She again used “environment” in a context that she appears to not fully understand. She gave no follow-up to that statement, which lead me to believe that she was unsure of what was “surrounding” her. Bertha continued to ask other questions related to being able to control the class without interference that would take away from her
freedom to teach children according to their individual needs. Being able to individualize instruction was Bertha's concern as she asked the questions. These responses were typical of Bertha, her concern for others and wanting to help them, especially in this writing exercise.

Bertha used the Analyzing skills of formulating questions, identifying components of the situation, and identifying unstated assumptions. She employed the skill of recognizing bias by her insistence that there be no discrimination between "slow and fast workers." In the category of Inferring, she utilized the critical thinking skill of generalizing ideas when she wrote, "It is very important that a teacher be allowed to teach the way he or she feels necessary for that student to learn, because everybody can't learn the same way."

In this essay she asked several questions followed by discussions which were based on her own opinions and personal experiences. For example, she asked, "Will I be free to teach my way where the student will benefit as well as the teacher? It is very important that the teacher go in to class with the attitude to teach in a way where everybody will benefit in some way or another." I interpreted these responses as generalizations for which she presented no explanation. She concluded with this question/statement: "Will I be allowed to use my own methods to motivate the class—each individual student separately?" I am not sure if Bertha intends her question to ask about motivating each student or if she is referring to teaching individual students, therefore, this response was not coded for use of a critical thinking skill.

Bertha used the Evaluating skills of judging the value of ideas and actions and judging the effectiveness of strategies. A total of seven critical thinking skills
were employed in this writing assignment.

**Bertha’s Critical Thinking Responses to Writing Assignment 5**

In this writing assignment students were asked to read a one-page article, “Clever Kanzi.” They were given ten minutes to read and then respond to the question, “From what you have read in this article, and based on your knowledge of language development, do you believe that Kanzi is mastering the human language? Explain your answer.” After reading the article, students were placed in groups of five to discuss the issue. Immediately after the discussion, each student was asked to write her own response(s) to the problem.

Bertha was placed in a group in which she was appointed by her peers to be the group leader. Writing assignment five was a nutshelling strategy in which the writer is asked to identify central ideas in a situation or from given information. Bertha wrote, “Today we were handed an article concerning language. The reading consisted of information pertaining to a monkey and whether or not they speak a language.” When I first read Bertha’s responses to this assignment I had doubts about whether she read the article in its entirety or whether she merely skimmed the page. Her responses did not indicate a clear understanding of the laboratory situation with Kanzi. After rereading her responses in an attempt to analyze her problem, I found that Bertha’s representation of the problem was underdeveloped. She did not have enough information (knowledge) about language development nor did she understand the context. I am convinced at this point that Bertha has a serious reading deficiency. She had difficulty with both assignments that required reading articles. It is possible that Bertha will not be
able to successfully complete the entrance examinations for teacher education because she will have to pass the state (West Virginia) required tests before being admitted to teacher education. To this date she said that she was afraid to take "those tests." "The system," therefore, will eventually "weed out" Bertha from the teacher education program.

She wrote her definition of language, "Language...the ability of being able to speak orally. Communication, on the other hand, is totally altogether different. We can communicate without opening our mouths."

In this article, Kanzi had learned to point to lexigrams on a keyboard to signify what action he wanted to perform. Bertha defined lexigrams as "symbols used for words." Although these terms (communication and lexigrams) were important within the context of the article, they became the main focus of Bertha's thoughts in this writing exercise. Therefore, I found it difficult to delineate the critical thinking skills which she might have used in relationship to the focus of the article. Since Bertha's responses served as a recorded source for her critical thinking, I gave her credit for using the skills of defining important terms, generalizing events and ideas, and determining the consistency of information.

Bertha wrote two pages of responses; however, she actually wrote two paragraphs about the question presented in this writing assignment. It is very likely that the article might have been beyond Bertha's present stage of understanding of language development. She was unable to express in writing whether language is uniquely human. Bertha digressed (Emig 1971) from the topic in an attempt to temporarily take her away from the writing problem.
Bertha's Critical Thinking Responses to Writing Assignment 6

Bertha had told me in the interview that this was the most challenging of the writing projects. The assignment asked students to construct a dialogue between two persons in which the concept of writing to think was being discussed or debated. She stated that she and her self-selected partner had shared ideas. Bertha wrote, "It was great! I realized I knew more than I thought I did."

Bertha’s partner was a very quiet twenty-five year old student who seldom volunteered to respond in class discussions. Bertha selected her, or they selected each other, to construct a dialogue between two teachers in which the concept of writing to think was to be discussed and/or debated. They wrote of the use of divergent and convergent thinking in teaching. Divergent thinking, they wrote, encouraged students to use their imagination and "not fix their minds in one direction."

In their dialogue, Mrs. Jones was trying to convince Mrs. Smith that if she taught children to think in a divergent way, they would be able to demonstrate their thoughts through writing. Mrs. Jones said, "I concentrated on divergent and convergent thinking. My reason for using divergent thinking was to arouse my students interest and show them that they should use their imagination and not fix their mind in one direction but to be able to answer questions that have only one answer and answer it correctly." This was the final statement made by Mrs. Jones and as confusing as it reads, I believe that these two students (Bertha and her partner) felt that they had responded "correctly" to the question.

The seven critical thinking skills used by Bertha and her partner in their written responses were: formulating a question; identifying distinct components;
identifying similarities and differences; interpreting and generalizing ideas; drawing conclusions from ideas; and judging the value of ideas.

A Summary of Bertha’s Critical Thinking Responses to the Six Writing Assignments

Bertha used a total of thirty-two critical thinking skills in her responses to the six writing assignments. This was approximately 27 percent of the 120 possible skills she could have used.

She employed the same proportion of the categories in Analyzing Arguments/Issues as she did of the category of Inferring. Bertha used the fewest critical thinking skills from the category of Clarifying Information. Table 6, which was drawn from Table 5, lists the skills and the frequency with which Bertha used these skills in the six writing assignments.

The fifth writing project was the only one in which Bertha did not use the skill of defining or formulating questions. The critical thinking skill, identifying distinct components of an issue, was used in assignments one, four, and six. The skill of identifying assumptions and reasons was used in assignments one and four. Writing assignment five was the only assignment in which Bertha used the skill of defining important terms. She also used the skill of identifying similarities and differences in this assignment that asked students to construct a dialogue.

In the category of Inferring, Bertha used the skills of generalizing events and ideas for five of the six assignments. Writing assignment three was the only assignment in which the generalizing skill was not used; instead she used the skill of determining whether conclusions follow from the information given. She interpreted and explained events and ideas in assignments one and six. In writing


TABLE 6

FREQUENCY OF USE OF BERTHA'S CRITICAL THINKING SKILLS IN WRITING ASSIGNMENTS

<table>
<thead>
<tr>
<th>Analyzing</th>
<th>Assignments</th>
<th>Number of Times Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analyzing</td>
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</tr>
<tr>
<td>Forming Questions</td>
<td>1, 2, 3, 4, 6</td>
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<tr>
<td>Identify Components</td>
<td>1, 4, 6</td>
<td>3</td>
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<td>Identify Irrelevancies</td>
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<tr>
<td>Define Terms</td>
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<td>1</td>
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<td>Identify Similarities</td>
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<td>2</td>
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<td>Identify Assumptions</td>
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<td>Sub-total</td>
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<tr>
<td>Clarifying Information</td>
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<td></td>
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<tr>
<td>Determining Credibility</td>
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<td>Determining Consistency</td>
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<td>2</td>
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<tr>
<td>Recognizing Bias</td>
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<td>Fact/Opinion</td>
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<tr>
<td>Sub-total</td>
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<tr>
<td>Inferring</td>
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<tr>
<td>Interpreting</td>
<td>1, 6</td>
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<tr>
<td>Conclusions Follow</td>
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<td>Generalizing</td>
<td>1, 2, 4, 5, 6</td>
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<tr>
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<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>32</td>
</tr>
</tbody>
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assignment one, Bertha used the critical thinking skill of investigating by seeking evidence as she searched for an answer to the question of when she learned to read.

Bertha evaluated issues using two critical thinking skills: judging the value of ideas and actions (writing assignments one, four, and six) and judging effectiveness of strategies (writing assignments one and four). She did not use these skills in this category: judging accuracy of ideas; identifying reasonable alternatives; and judging issues that are strong and relevant or weak and irrelevant.

Table 6 verifies the difficulty Bertha had with writing assignments two, three, and five. Assignments two and five involved reading articles that were related to the content of the course. Examination of her responses in these two writings revealed the use of only three critical thinking skills, which perhaps reveals a reading deficiency in comprehension since they both involved reading about a topic before completing the writing assignment.

Bertha used the Inference skill of generalizing ideas and issues in both of the reading/writing exercises. However, she used two Analyzing skills (defining questions and identifying similarities and differences) in the second assignment; The Clarifying skill of determining the consistency of information, and the Analyzing skill of defining important terms were used in the fifth assignment.

Assignment two required students to read an article and project themselves into the situation for the purpose of increasing their involvement with the issue. Given the problem that Bertha had in the past with reading comprehension, she had difficulty identifying the components in the issues and generally showed little evidence of analyzing, inferring, and evaluating the situations.
In the first assignment, a ten minute freewriting exercise, Bertha was able to define the question, identify the distinct components, and identify assumptions and reasons. This writing was based strictly on personal experiences and she wrote freely. She determined the consistency of the information available in her experiences, interpreted and explained ideas and events that led to her desire to learn to read. She was thirteen years old, a fact she repeated several times, before she actually understood what she read. In this writing she was able to generalize the events that led to her emerging literacy. Bertha evaluated the situation by judging the value of ideas and actions and by judging the effectiveness of strategies involved in her beginning reading.

The nutshelling writing activity (writing assignment five) was also difficult for Bertha, and once again, she was required to read an article before she could respond. She used only three of the critical thinking skills in responding to the problem, and the same pattern followed as in writing assignments two and three, she used one of the Clarifying skills in assignment five and none in assignment two. None of the Evaluating skills was used in these two assignments (two and five).

In the other two assignments (writing assignments four and six), Bertha used seven critical thinking skills in each project. Three skills of Analyzing Arguments were evoked by the assignments, while three of the Inferring skills were used in assignment six and one in assignment four. Only one of the Evaluation skills was employed in these two assignments.

These patterns, noted from her responses in the writing assignments, seem to reveal the areas where Bertha could benefit from remedial or developmental assistance in reading. In summarizing and analyzing Bertha's responses to the
writing assignments, I found that her problem lies within the Task Environment (Flower and Hayes’ Cognitive Process Model of Writing). In nearly every assignment, Bertha’s representation of the rhetorical problem was either inaccurate or underdeveloped. Therefore, she was unable to solve or attend to the various aspects of the problems. Perhaps writing that requires reading by low ability students is not of value for evoking critical thinking skills.

Bertha had a great deal of difficulty in writing about information that was not found in the text. I suspect that Bertha was able to gather information about the text material from her associates in class and from those with whom she commuted to college each day. In the process of this information being transferred to her by her friends, many misinterpretations could have occurred. The basis for this analysis is found in Bertha’s journal writings where she wrote often of others helping her with “school work,” by reviewing and discussing the content of the courses. They “reviewed” during the trip (approximately 70 miles) to and from the college. Bertha also wrote of the difficulty she had with reading “all that stuff” for her classes. She puts forth a great deal of effort to complete assignments and to please her teachers. She very easily fits into Position 1, Basic Duality, of Perry’s (1981) scheme of cognitive development and shows some growth toward the transition from Position 1 to Position 2. For example, she perceives her professors as Authority and believes that they have all the answers, yet her association with the college community, her peers, is revealing that differences of opinions exist. She wrote in her journal on one occasion, “I didn’t see that in the book, so I wasn’t sure what you wanted.”

Bertha wrote in her journal that she really enjoyed the Reading Process class because she was “learning so much about the process of reading” and that
she is now able to recognize her own reading problems, especially in comprehension. Although she did not specify her reading problems, I believe that if she recognizes that she has problems, she might ask for assistance in overcoming the reading deficiencies.
A Portrait of Elena

Elena is an attractive 20 year old woman from southwestern Virginia. She spoke of living in the “country” on a farm and yearned “to live in town with other kids” because she was ashamed of being a “farm girl.” Currently, Elena lives in her own apartment in southern West Virginia and says, “I would rather be living in the country where I can have all the fresh air I want.”

As a result of being raised with a brother and “a whole bunch of boys in the neighborhood,” Elena believes she was a “tomboy,” playing in tree houses, jumping fences, playing baseball and football. Elena has modeled clothes for several dress shops in the area but said she did not want to do that type of work all her life.

Elena did not remember her father reading to her as a child, but her mother read “big, thick Bible story books” to them, and as they grew older, she and her brother read those books to each other. Elena loved the Bible stories as well as Charlotte’s Web and Dr. Seuss’ books.

Elena said, “My parents were real strict; religious, you know.” She is attending church with her fiance who is of another faith. She stressed, “I won’t convert, but I do like the … church. As long as I don’t convert, my parents won’t say anything. I will raise my children as … but I won’t change. I don’t really have a choice, you know.”

Elena’s fiance is twelve years older than she and has a twelve year old daughter from a former marriage. He is employed as a service department supervisor at a local business. Elena is employed as a part-time secretary for a non-profit organization in southern West Virginia. She wrote, “Can you imagine
me raising a twelve year old daughter?"

Elena's mother completed a two-year business program and works in an administrative position with a company in the same area as her home. Her father received a two-year technology degree and is employed by a local engineering firm.

Elena excitedly told about her two-week tour of the Soviet Union and two other countries that she and seven of her friends made during the summer after her graduation from high school. She said, "It was wonderful—just a bunch of kids with a sponsor!" Other than this tour, she has traveled only to Myrtle Beach, South Carolina.

In the interview Elena said that her parents insisted that she go to college but she wanted to go to Myrtle Beach and work. "I was so sick of school; it ties me down. I wanted to be a beachcomber or waitress," she said. Now her goal is "to be a teacher, get married, and take my family to church on Sunday, and all that. You know, the All-American Dream."

Her parents no longer provide financial assistance for her education because, "If I didn't make the dean's list, they weren't paying for it." Elena spoke of a resentment toward her parents for not permitting her to attend a university away from home as her friends had done. So, she moved to an apartment. "My parents are very, very strict and religious. I wanted to wear big earrings, lots of make-up, wild hair, but I never could do that when I was at home."

Elena's elementary school days were "Okay." She attended schools in southwest Virginia and said, "The schools were traditional, you know, read, write, discuss. Middle school was horrible because everybody was labeled city kids,
farm kids, Yankees.” However, her social studies teacher had a variety of activities for the students to do but the others, she said, were “just plain boring.”

In high school her favorite teacher taught English and prepared her for college. “I never read so much in my life, but she was great!” In her sophomore year of high school, she was in Advanced Placement classes, but she had to work in a grocery store to supplement the family income. As a result of her work hours at the store, her grade average went down that year. “It seemed like my work took over and my grades began to drop, but I didn’t care, ’cause I was tired anyway.”

Elena’s areas of strength in college, to this point, have been in English and computer technology. She decided to enter college because “I wanted to make something out of myself, and the job I have now with . . .—I don’t know. I just don’t want to work there the rest of my life.”

The majority of her friends are older than she and they go to movies together, to clubs, have quiet parties in their apartments, and play the game of Trivial Pursuit®. Her girlfriends have all graduated from college or will graduate soon.

Elena wants to specialize in the field of Learning Disabilities because she has two cousins with this problem and one cousin who has Down’s Syndrome. She said, “I am the only one in the family who could ever work with them, and I enjoyed it so much.” She has not taken any classes in special education because her major for the first year in college was a nonteaching field. Her college advisor recommended that she take one or two classes in special education at the undergraduate level, then get her Master’s degree in Learning Disabilities.

Elena spoke of taking one semester off from college after she changed
majors because, as she said, "I felt tied down. I just did what I wanted to do, spending weekends with friends, hanging out at the mall, and things like that. School ties me down."

Writing assignment two was difficult for Elena, she said. This assignment required the use of evaluation and she complained, "You had to get into her mind and see what was going on." The sixth assignment, however, was "fun because I was in control. It was what I wanted to say and what my partner wanted to say. It was about what we wanted to talk about. It wasn't like a set standard...like, you write about this, and this is what I want you to say."

When I asked what she perceived to be the strength of the Reading Process class, Elena quickly responded, "The journal. I mean, it is a way that I can talk to you. It is like you and I have an ongoing conversation twice a week. You know what is going on in my head."

An Examination of Elena's Critical Thinking Responses to Six Writing Assignments

Elena's Critical Thinking Responses to Writing Assignment 1

Assignment one asked students to respond to the following situation:

Write what you can recall when you learned to read. Include the situation under which your reading began and tell why you wanted to learn to read.

This assignment was a ten-minute freewriting activity. Its purpose was to encourage students to write without the fear of being evaluated on their grammar, spelling, or format and to let the writing generate their thinking (Elbow 1981).
Elena wrote that she “vaguely remembered learning to read” but that she did remember when she could not read and wanted to learn. She stated, “People would read to me from the other side of the book. I felt left out and wanted to be on the other side of the book. So I would pick up a book and pretend to read or make up stories from the pictures.”

After Elena learned to read, the first books that she read were Charlotte’s Web, Little House on the Prairie, and Bible stories about Noah and the Ark, David and Goliath, and others. She spoke of how exciting these stories were to her and how great she felt when she could read them on her own.

In the category of Analyzing, she used the skills of defining the question and identifying distinct components. Elena determined the consistency of information and used all but one of the critical thinking skills in the category of inferring. These skills were interpreting and explaining events and ideas, generalizing events and ideas, drawing conclusions from events and ideas, and seeking evidence by investigating the issue. In the Evaluation category of critical thinking skills, she used judging the value of ideas and judged the effectiveness of specific and general strategies. Table 7 depicts the skills that Elena used in each of the writing assignments.

Elena used a total of nine critical thinking skills in responding to the question. Her description of “being on the other side of the book” revealed a vivid imagination in this situation. She wrote as if she were telling a story, i.e., she began with, “I first began to read...” and ended with, “Even now, twenty years later....” This first writing elicited more critical thinking responses from Elena than the other five assignments.

Britton (1983) discovered that when the student decides to write and to
<table>
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<th>Writing Assignments</th>
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<th>Clarifying Information</th>
<th>Inferring</th>
<th>Evaluating Arguments</th>
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TABLE 7

Elena's Critical Thinking Responses to Six Writing Assignments
make decisions about what is significant is “grounded” on the writer’s experience. In the case of Elena, she relied on her experiences and the Inferring skills of critical thinking to generate information for her writing.

**Elena’s Critical Thinking Responses to Writing Assignment 2**

The first part of the question in the second writing assignment used the “nutshelling” strategy: “What do you think is the major problem addressed in this article? Explain your answer by discussing the classroom situation.” Elena wrote that the teacher was the major problem because she was “impersonal, cold, and indifferent.” She described the classroom situation as “complete chaos” with a teacher who did not listen to Wendy or to the other students as they read. Then Elena wrote that she thought Wendy was spoiled, but since the child was a first grade student, “she was not much more than a baby, and babies can’t be perfect.” In this portion of the writing exercise, Elena used the critical thinking skills of defining the situation and identifying distinct components of the issue.

Part two of the question was a dramatic scenario in that the student was asked to take on the role of a mother/father or a brother/sister in analyzing Wendy’s behavior at the end of the school day. Elena began, “As Wendy’s mother, I am somewhat perturbed with her. Her behavior was terrible after school today.” Elena continued as Wendy’s mother, stating that the child’s behavior was so out of character and that a spanking would not have helped because Wendy had a reason for her outburst.

Then, it appears, Elena projects her own past (based on the information from the interview) into the explanation because she becomes totally involved.
She wrote several reasons why she thought Wendy had behaved so aggressively. She said, "I'm not the greatest mother. I probably should stay home more. I know I work too much, but she has two great brothers and a terrific father. She is her daddy's girl...he can handle her, because I just do not understand her."

Because Elena wrote two pages very quickly, it appears that she was still seeking an absolute answer to the question. She became "wrapped-up" in the emotional aspects of the problem which she created and was unable to work her way free.

In this assignment Elena used the critical thinking skills of defining the question, identifying distinct components, determining the consistency of information, distinguishing between fact and opinion, generalizing events and ideas, drawing conclusions, judging the accuracy and completion of ideas, and investigating by seeking evidence. She used a total of eight of the twenty critical thinking skills in her responses to this writing exercise.

**Elena's Critical Thinking Responses to Writing Assignment 3**

This was a focused writing assignment in which the writers were asked to concentrate on a single topic by writing a mid-term examination essay question and to answer their own question. Students were allowed fifteen minutes to write their questions and answers. Elena's question was: "Explain the various diagnostic tests and surveys given to test reading readiness in young children." She began with this response, "First, a child must be examined by trained specialists that check their eyes and hearing. This ensures that there are no auditory or visual problems." The she wrote, "a set of various tests are given, such as the Sand Test by Marie Clay." Elena was aware of some facts about surveying children for
reading readiness, but once again she became entangled in unrelated information that she could not connect or integrate into the problem.

Elena listed several factors for determining the “reading ability and potential in children.” Her list included color blindness, left-handedness, previous exposure to reading, whether parents had read to their children, and the ability to recognize letters of the alphabet.

In Elena’s response to her question, she used a total of four critical thinking skills. The skills were: formulating a question; generalizing events and issues; judging the value of ideas and events; and judging effectiveness of strategies.

Elena’s Critical Thinking Responses to Writing Assignment 4

Fifteen minutes were allowed for responding to a dramatic scenario in which the student is asked to teach a third grade reading class at a school where she had previously tutored a child in reading. The question was: “What important facts about this situation need to be considered before you agree to teach the class?”

In her responses Elena used these five critical thinking skills: formulating the question; identifying distinct components in the issue; interpreting ideas; generalizing events and ideas; and investigating by seeking evidence. Elena stated that she would first want to “check out the background of the class in general and then check each particular student’s background.” She also wanted to know what the class had already read, how far along they were in reading, and what they generally enjoyed reading. Elena wanted to know whether these children had seen any plays or movies pertaining to the books they had read. She stated that “it
must be determined if the class is for the learning disabled, average, or gifted.”

The few responses Elena made were very well stated; however, she did not explore any of them. Although the class had been asked to write for fifteen minutes, Elena completed her writing in seven minutes and then put her head down on the desk.

Elena’s Critical Thinking Responses to Writing Assignment 5

Writing assignment five was a nutshelling strategy with the purpose of encouraging the writer to identify the central ideas in an article, “Clever Kanzi.” Students were allowed approximately ten minutes to read the article with this question in mind: “From what you have read in this article, and based on your knowledge of language development, do you believe that Kanzi was mastering the human language?” Elena wrote, “Language is definitely a human trait.” She then wrote about her horses who understood her moods, her tone of voice, and her touch. “My cat,” she said, “knows all my problems, thank goodness she can’t talk. But my animals do not possess the ability to reason.”

In one of Elena’s journal entries following the Kanzi article, she wrote, “I never did get around to talking about Kanzi. It was a good debate. Studies have been going on for many years concerning abilities and potential of animals (especially chimps) to practically exist as humans. I forgot about this entry, so I forgot what to write.” This was a typical example of Elena’s attitude, as expressed in her writing. Although she stated several times in her journal writing that she needed to “get busy and get school work done,” she consistently complained about her job taking up so much of her time. Students were placed in groups of
five to discuss their responses with their peers. Elena was in a group with two other traditional students and two nontraditional students. All but one in Elena’s group were active participants in class discussions and class activities. Upon discussing the situation with their group members, students were given ten minutes to enter their own responses in their journals. Apparently, Elena did not write her response at the assigned class time.

In examining Elena’s comments, I found it difficult to determine (from her journal entry) whether she had indeed read the article even though the actual reading was done in class on the same day that the writing assignment was to have been completed. She wrote in generalities and did not point out specific incidents to verify her comments. However, she used the critical thinking skills of defining the question (which I believe was included in her responses), determining whether conclusions follow from information given, and generalizing events and ideas.

Elena’s Critical Thinking Responses to Writing Assignment 6

Writing assignment six was a dialogue between two self-selected students. As students selected their partners for the activity, I observed their choices, and obviously two or three students chose friends or acquaintances in the class. In moving about the classroom as selections were being made, I made sure that no one would be isolated. Elena’s partner was sitting next to her which is the way most students made their choice for a partner.

The dialogue began with Sarah asking Elena if she had learned how writing could be used to teach students. Elena’s reply was, “Well, I prefer the bottom-up
approach to teaching students to read because it provides a good stable foundation for the students in order to aid them as they get older and continue to progress to a higher level so that they can write.” Of course, this response did not focus on Sarah’s question. It appeared that Elena was grasping for an answer. Sarah dominated the dialogue and finally wrote that writing should be fun. Elena responded with, “Right! When writing becomes fun…they enjoy it so much that they look forward to it.”

It is obvious from the responses of these two students that they floundered in an attempt to answer the question. This writing exercise required the writers to generate, clarify, and order their thoughts (Moffett 1981, 49). Perhaps the concept was too abstract for these two students to expound on, so they went from applying writing to when they would begin teaching, to applying writing with the top-down, bottom-up theories of reading instruction, and finally, to perceiving writing as a “fun” activity. Neither of these students had enough contextual knowledge to develop a reasonable answer to their general question of what they had learned about “how writing could be used to teach students.”

Elena used the critical thinking skills of identifying similarities and differences, generalizing ideas and issues, and drawing conclusions. She used a total of three of the twenty skills in her responses to this writing assignment.

A Summary of Elena’s Critical Thinking Responses to the Six Writing Assignments

Elena wrote in one of her journal entries that she sometimes finds it difficult to “shift gears all day—on both Tuesdays and Thursdays.” (These were the two days that the Reading Process class met.) She had a class from 8:00 to 9:15 AM; she
went to her job from 9:30 AM to 12:30 PM; returned for the Reading Process class from 1:00 to 2:15 PM; and returned to her job from 2:30 to 5:30 PM. There were instances when Elena would enter class tardy, but she would become involved in the class activities immediately. She wrote, "I wish I was independently wealthy—I could support myself and I would have more time to spend on outside assignments—enjoying my college days."

Early in the semester, Elena wrote about working in groups in the class and that she did not like this method because, "...as children we are taught/told not to discuss things w/ other children, to stay in our seats and be quiet. Then as adults, we are told to get into groups and discuss." She continued, "In college we tend to develop the habit of just wanting to go to class, study, take a test, leave and not bother w/ other things. I'm guilty of that also. I prefer to go to class, listen to the lecture and leave—not discuss or participate in discussions." Two months later she wrote, "I used to hate writing in this thing, but I enjoy it more very day. I even enjoy being in groups, telling my ideas, and listening to what others have to say."

At this point, there is no way of determining whether Elena's working schedule had any effect on the types of responses or the extent to which she delved into the problems that were presented to her in the writing assignments. I tend to believe, through careful examination of her writings, that Elena was burdened by her off-campus work schedule combined with sixteen semester hours of course work.

In examining Elena's responses for critical thinking skills employed throughout her writings, I found that she used a total of thirty-two of the 120 skills. Table 8 which was derived from Table 7 depicts the frequency with which she used the skills of each category in the six writing assignments. In the area of
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Analyzing Arguments/Issues, Elena used defining or formulating questions in five of the exercises; identifying distinct components in three of the writings; and identifying similarities and differences in one assignment. She did not use the Analytic skills of identifying and working with irrelevancies, defining important terms, or identifying assumptions or reasons in any of the six writing assignments.

In the category of Clarifying Information, Elena used determining consistency of information in assignments one and two and the skill of distinguishing fact and opinion in assignment two. The skills of determining credibility of sources and recognizing bias were not used in any of the writing assignments.

The category ofInferring had five sub-skills. Elena used all of these at least once; in addition, she used the skill of generalizing events and ideas in each of the six assignments. Determining whether conclusions will follow from information given was used only in the fifth writing assignment. The skills of interpreting and explaining events and ideas were used in assignments one and four, while drawing conclusions from events or ideas was used in assignments one, two, and six; and the critical thinking skill of investigating by seeking evidence was used in assignments one, two, and four.

Skills in the category of Evaluating were used a total of five times. These skills were: judging the value of ideas and actions (writing assignments one and three); judging effectiveness of specific and general strategies (assignments one and three); and judging accuracy and completion of ideas (writing assignment two). The evaluating skills, identifying reasonable alternatives and judging issues that are strong and relevant and weak and irrelevant were not used in any of the
writing projects. Elena used more skills (fifteen in the Inferring category) than she
did in any of the other categories; and the fewest number of skills were used in
the category of Clarifying Information.
A Portrait of Diana

Diana is nineteen years old and is a sophomore in college majoring in elementary education. She is a first generation college student which means that she is the first in her family to attend a college. According to the guidelines set by the college admissions office, she is characterized as a "traditional" student. She was born and raised in a southeastern county in West Virginia and lives at home with her parents in the same community in which she grew up.

Diana has been engaged to be married since September 1990 and plans to be married in August 1991. Her fiance, whom she met through a mutual friend, works as a mechanic in a local automobile garage.

As a four year old, her mother and grandmother read to her, especially before she went to bed; to "get me to go to sleep," Diana said. They read to her such books as The Poky Little Puppy and Bambi; but her favorite was The Little Engine that Could.

As an only child, Diana believed that she received a lot of attention from her parents and grandparents. When she was eight years old, her fifty-year-old grandfather drowned in a creek behind her house. Diana did not want to talk about the incident except to say that as a child, she had a difficult time overcoming this tragedy and was still "working through the problem."

Diana's parents are happy to have her at home with them, and she stated, "I really don't mind being at home because I can save my parents money by living at home." Diana had worked as a secretary in the office of a furniture store, but she is no longer employed there. Her mother is a high school graduate but has never worked at a "paying job." Diana was pleased to tell that her mother...
dedicates much of her time to church activities and is presently writing a book about the history of their church. Diana spoke of being quite uncomfortable talking with her mother about personal problems, but she does have a friend with whom she can confide.

Diana's father drives a heavy equipment truck for a railroad company. He did not graduate from high school but completed his high school requirements in the army. He is very quiet, Diana said, but he likes joking with her.

Diana attended a small elementary school and spoke of her third grade teacher as one who, "...did all kinds of activities and projects with us like taking us on field trips, playing games, and having different kinds of contests." Diana nominated this teacher for "Teacher of the Year" for the county in which she teaches. She was thrilled that the teacher sent her a letter thanking her for the nomination.

In junior high school, her physical education teacher was one whom the students trusted, and they would approach her about their problems and ask for her advice. She said junior high was "Okay." The classes were small and "everyone, including my teachers, got to be close."

An English teacher was her favorite high school teacher. In her classes, students kept journals in which they wrote how they felt about poems and stories which she (the teacher) would read. There were some days when they were given "a free day to write whatever we wanted."

Diana was in the business curriculum and was not required to take algebra. However, she did take business mathematics and two years of accounting.

Diana told of a social studies class, "Contemporary America," where
students discussed day-to-day events occurring in the country. She said, "The teachers encouraged us to write how we felt about what was happening." Diana said that she "loved" that class because it gave her an opportunity to express her feelings.

At the present time, Diana is active as a youth leader at her church. They are involved in such activities as holding programs at the church and participating in church fund-raising programs, and as a group, they attend picnics and visit with other youth groups in the area.

The extent of Diana's travels are the occasional family trips to a beach in Florida and visits to relatives in North Carolina. She and her friends do little traveling, but they do get together at the movies, the mall, and spend "hours on the phone."

Diana graduated as salutatorian of her high school class of approximately 350 students and received a scholarship from a local women's organization to attend the college or university of her choice in West Virginia. She majored in business administration during her freshman year at college but decided to pursue a degree in elementary education after teaching grades two through six at her church Bible school.

The writing assignment which she thought the most challenging was writing assignment two because she had to project herself as Wendy's sister. Since she has no brothers or sisters, it was difficult for her to relate to those experiences, she said. Furthermore, "You had to look at this classroom situation from two points of view--as a teacher, first--then as a sister."

Diana appeared to be uncomfortable during this interview. She is an extremely quiet person with a desire to talk if given the opportunity. She had
arrived at the stage of volunteering information by the end of the semester, but I believe the one-on-one situation of the interview invaded her quiet world. Nonetheless, her responses during the interview were honest and to the point.

An Examination of Diana's Critical Thinking Responses to Six Writing Assignments

Diana's Critical Thinking Responses to Writing Assignment 1

The first writing project asked students to recall when they learned to read and the conditions under which they learned to read. (Table 9 depicts the critical thinking skills Diana used for the six assignments.) Diana recalled that she began to learn about reading when her mother read stories to her nightly, and sometimes she would dream about the stories. As Diana grew older, her mother helped her pronounce some of the words. She remembered learning the words "I", "me," and "go." Additionally, Diana was able to relate some words in the story to the pictures on the page. She wrote, "One particular reason why I wanted to learn to read was because I wanted and needed to know some of what was happening in the pictures." She also stated, "I would consider myself to be a very curious child and I wanted to learn 'why' on my own. I had to know everything."

Diana remembered her grandparents reading to her. She wrote, "Reading a story was a way of getting close to the people I loved. I liked to hear them talk." Although her father spent much time reading magazines and newspapers, Diana did not remember him reading to her.

Table 9 presents a list of the writing assignments with the critical thinking skills that Diana used in each assignment. In her responses, Diana used three of
<table>
<thead>
<tr>
<th>Writing Assignments</th>
<th>Analyzing Arguments</th>
<th>Clarifying Information</th>
<th>Inferring</th>
<th>Evaluating Arguments</th>
<th>Total of Skills Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 January 31</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>11</td>
</tr>
<tr>
<td>Recall learning to read (Freewriting)</td>
<td>x x</td>
<td>x x</td>
<td>x x</td>
<td>x x x</td>
<td>x x</td>
</tr>
<tr>
<td>2 February 26</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>15</td>
</tr>
<tr>
<td>Nonconformist (Nutshelling &amp; Dramatic Scenario)</td>
<td>x x</td>
<td>x x</td>
<td>x x</td>
<td>x x x x x x x</td>
<td>15</td>
</tr>
<tr>
<td>3 March 19</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>12</td>
</tr>
<tr>
<td>Mid-term Exam Question/Answer (Focused Writing)</td>
<td>x x x x</td>
<td>x</td>
<td>x x x x x</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>4 April 30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>13</td>
</tr>
<tr>
<td>Teaching Reading for One Week (Dramatic Scenarios)</td>
<td>x x</td>
<td>x x x x</td>
<td>x x x x x x x x</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>5 March 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>12</td>
</tr>
<tr>
<td>Kanzi - Language (Nutshelling)</td>
<td>x x x</td>
<td>x x x x</td>
<td>x</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>6 April 9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>Dialogue - Writing to Think (Dialogue)</td>
<td>x x x</td>
<td>x x x x x x x x</td>
<td>10</td>
<td></td>
<td></td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Critical Thinking Skills</th>
<th>PFQ</th>
<th>IDC</th>
<th>NI</th>
<th>IW</th>
<th>ITD</th>
<th>ISD</th>
<th>JAR</th>
<th>DCS</th>
<th>ROC</th>
<th>RCB</th>
<th>DFO</th>
<th>IEE</th>
<th>ICF</th>
<th>GEF</th>
<th>DES</th>
<th>JAN</th>
<th>JVI</th>
<th>IRA</th>
<th>JES</th>
<th>JSW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Critical Thinking Skills Used</td>
<td>6</td>
<td>6</td>
<td>0</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>6</td>
<td>3</td>
<td>6</td>
<td>6</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>2</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>Total Skills for Each Category</td>
<td>23</td>
<td>7</td>
<td>26</td>
<td>17</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
the Analyzing critical thinking skills. These skills were: defining a question; identifying distinct components; and identifying assumptions and reasons, stated and unstated. The two Clarifying skills which Diana utilized in responding to the problem were judging the consistency of information and distinguishing between fact and opinion.

Diana used four of the five Inferring skills in this writing: interpreting and explaining ideas and events, generalizing events and ideas, drawing conclusions, and investigating by seeking evidence.

Finally, Diana used the Evaluation skills of judging the value of ideas and actions and judging the effectiveness of specific and general strategies. This was a ten minute freewriting exercise that asked her to recall when she began reading. Diana was precise and to the point in her responses. She used a total of eleven of the twenty critical thinking skills in this assignment.

Diana's Critical Thinking Responses to Writing Assignment 2

This writing assignment consisted of two parts, nutshelling and dramatic scenario. The first part of the project asked writers to determine what the major problem was in a hypothetical classroom setting. The problem situation was in a first grade reading classroom. Part Two of the assignment asked the students to project themselves into the role of Wendy's mother/father or brother/sister to analyze Wendy's behavior upon their arrival to take her home after school.

Diana analyzed the major problem addressed in the article as the teacher not letting the children be themselves—not allowing them to be free. "Ms. Snyder needed to understand that her students need time to express their feelings and to
be relaxed. The biggest mistake she made was ignoring the enthusiasm of Wendy wanting to read,” Diana wrote. She said, “Teachers should give students the opportunities to do something creative and constructive.”

For the dramatic scenario portion of the problem, Diana assumed the role of Wendy’s sister and said that Wendy behaved as she did because she had to release her pain and frustration on someone and because she had “a bad day at school.” Diana continued, “She needed and wanted attention, I need to listen to Wendy.”

Diana concluded her interpretation of the situation by writing that children become discouraged, disappointed, and lose interest when parents or teachers do not allow them to be free. She exhibited tremendous insight about children and how “they should be encouraged to be free—and to speak what is one their minds.” Her final statement in this writing project was, “A child needs to be open and he or she must learn not to be shy.” Diana is a very shy person, and this statement may well relate to her own feelings.

Diana employed all but five of the twenty critical thinking skills in this assignment. The responses included the following skills: defining the question; identifying distinct components; identifying similarities and differences; identifying assumptions and reasons; determining consistency of information; recognizing bias; interpreting and explaining events and ideas; determining whether conclusions follow from given information; generalizing events and ideas; drawing conclusions from events; and investigating by seeking evidence. The evaluation skills she used were: judging the accuracy and completion of ideas; judging the value of ideas and actions; identifying reasonable alternatives; and judging the
effectiveness of specific and general strategies. Diana used four of the Analyzing skills, two of the Clarifying skills, all of the Inferring critical thinking skills, and four of the Evaluating skills.

Diana's Critical Thinking Responses to Writing Assignment 3

This writing assignment was a focused writing strategy in which the writer was asked to construct a mid-term examination question and to provide an answer for the question. Diana's question was: “Discuss the top-down theory and the bottom-up theory of reading and give examples of each.”

This assignment was a focused writing and invited students to center their attention on a single topic for fifteen minutes. Focused writing enables students to recognize how much knowledge they have about a particular subject. Diana's responses did indeed focus on the topic; she used twelve of the twenty critical thinking skills. The question was defined, and each approach was described by Diana.

The example Diana gave for the top-down theory was the language experiences approach, and she gave the basal reader as an example of the bottom-up theory. She described the language experience approach as a method that enables a child to create her own story. The bottom-up theory was described by Diana as one in which “The child must first learn the sounds of each letter, the rules of putting those letters together to make words, and also learn the meanings of words. The child learns to put words together to make sentences. This is a long process and the child may find this approach boring or tiring.” Diana preferred the top-down approach to teaching reading because “this approach
enables a child to use creative writing, enjoy the use of the imagination through reading, and experience the joy of writing.”

Other critical thinking skills in the category of Analyzing which were used by Diana were identifying distinct components, defining important terms, and identifying similarities and differences. She used none of the Clarifying skills in this writing, but she did use four of the five Inferring skills: interpreting and explaining events and ideas; generalizing ideas; drawing conclusions; and investigating by seeking evidence. She also used four of the five Evaluating skills in her responses for this assignment: judging the value of ideas; identifying reasonable alternatives; judging effectiveness of specific strategies; and judging issues that are strong and relevant.

In this writing exercise, Diana stated the concern that children need to express themselves through writing. She feels that being able to express herself is essential to helping a child develop self-confidence.

Diana’s Critical Thinking Responses to Writing Assignment 4

This dramatic scenario involved the students in writing about the important facts they would need to consider before they would agree to teach a third grade reading class for one week. This writing was completed in a ten to fifteen minute time span. After the writing, students discussed their responses with their peers in self selected groups of three.

Diana used thirteen critical thinking skills in writing about the facts that she would need to consider before accepting the invitation. The skills employed were: defining the question; identifying distinct components; identifying assumptions and
reasons stated; determining the credibility of sources; determining the consistency of information; interpreting and explaining events and ideas; determining whether conclusions will follow from information given; generalizing ideas and events; drawing conclusions from ideas; investigating by seeking evidence; judging accuracy and completion of ideas; judging the value of ideas; and judging the effectiveness of specific and general strategies.

Diana wanted to know what type of reading program Clay Elementary was using and how far along the children were in the program so that she would know where to begin her teaching. She also wanted to know what skills she would be responsible for teaching. She also asked about the size of the class because she wrote that "if there are too many students in a class, the possibility is greater that they might not receive adequate help with their reading problems." She wrote further that she would like to have some information about the students so that she could be better acquainted with them.

Diana wrote, "I would like to know the daily routine of the class. Another important fact I would ask would be if there are any specific goals or objectives that need to be obtained for that particular class." Of the four case studies, her questions were the best ones submitted for this writing exercise.

Diana's Critical Thinking Responses to Writing Assignment 5

Students were asked to read the article "Clever Kanzi" and to decide (based on their knowledge of language development) whether Kanzi had mastered the human language. Students were placed in groups of five to discuss the issue (after reading the article). Immediately following the group discussion, each group member wrote her own decision on the question. In this nutshelling writing
strategy, Diana explained that she believed Kanzi had a language of its own.

Diana wrote that Clinton, a biology major in her group, had explained to them that animals use instinct in approaching problems, while humans use reasoning in problem solving. She remarked, "It's amazing to me to see the difference—I never had really thought of it in that way." Diana compared the ape's method of communicating to that of a baby who is not able to talk well enough for others to understand what he is saying. The jabbering noises that the baby makes are his means of communicating.

Diana wrote that she thought the article was very interesting but concluded that, "Everyone had to have an open mind while discussing this article and there were conflicting opinions and feelings in my group." Diana's group consisted of a biology major, two students who usually sat beside her and tended to speak their opinions more often than Diana, and an elementary major (female) who was quiet and withdrawn in class discussions.

Diana employed twelve of the twenty critical thinking skills in her written responses to this issue. Specifically, she used the Analyzing skills of defining the question, identifying distinct components, defining important terms, identifying similarities and differences, and identifying assumption and reasons that were stated and unstated. In the category of Clarifying Information, Diana used the skill of determining the consistency of information. Four of the five Inferring skills were included in her responses: interpreting and explaining ideas and events; determining whether conclusions will follow from given information; generalizing ideas and events; and drawing conclusions from events or ideas. In the category of Evaluation, Diana used the skills of judging the effectiveness of general
strategies and judging issues that were strong and relevant.

Diana's Critical Thinking Responses to Writing Assignment 6

With this writing assignment (a dialogue between two self-selected students on the topic of writing to learn), Diana and her partner, Tara, chose to role-play two teachers in attendance at a reading conference. Ms. Smith began by stating that she had two students who were failing the fifth grade because they could not comprehend questions after reading a selection. Ms. Tucker told her that all of her students were doing well and asked Ms. Smith what types of questions she asked. Ms. Smith said that she gave them specific questions that were related to details in the reading assignment. The discussion then led to divergent thinking and that maybe Ms. Smith should give her students the kinds of questions that would allow them to give their opinions or interpretations in writing after they completed the reading. Then Ms. Tucker suggested putting them in “discussion groups” so that they could share their opinions.

Tara, Diana’s partner for this assignment, was a very quiet student who had a great deal of trouble keeping class assignments up to date throughout the semester and averaged a C- or D on her final grade for the course. I was surprised that Diana chose her as a partner to construct the dialogue, but they sat beside each other that day and perhaps, because they were both shy and did not look beyond each other for another selection.

Diana’s responses revealed the use of the following critical thinking skills: formulating the question; identifying distinct components; defining important terms; identifying assumptions and reasons unstated; interpreting and explaining
ideas; generalizing ideas; drawing conclusions from ideas; and investigating by designing experiments. Diana did not employ any of the Clarifying skills. However, she did use the Evaluating skills, judging accuracy and completion of ideas and judging the effectiveness of general strategies. Her responses for this writing assignment were the lowest of the six exercises. Since this required students to work in pairs, Diana did not write as freely as she would, had she been in a larger group. Her shyness was a deterrent in this exercise because she had to respond in a one-to-one situation. In a larger group she could listen and comment when she felt "comfortable" enough to respond.

A Summary of Diana's Critical Thinking Responses to the Six Writing Assignments

Diana appeared reserved regarding her personal life as well as her beliefs about a variety of issues. In writing these same feelings, she had no problem; in fact, she preferred writing her responses to verbalizing them. In the interview she was reluctant to speak or to express her views. However, she expressed these same views splendidly in her journal writing assignments. Table 10 reveals the frequency with which she used each of the critical thinking skills in the assignments.

Diana had no problem defining or formulating the questions and identifying the distinct components in the six writing projects. These two processes seemed to fall naturally in place as she responded to the situations.

Writing assignment two, which was completed during the first part of the semester, yielded more critical thinking skills (fifteen) than the other five
TABLE 10

FREQUENCY OF USE OF DIANA’S CRITICAL THINKING SKILLS IN WRITING ASSIGNMENTS

<table>
<thead>
<tr>
<th>Analyzing</th>
<th>Assignments</th>
<th>Number of Times Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analyzing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Forming Questions</td>
<td>1, 2, 3, 4, 5, 6</td>
<td>6</td>
</tr>
<tr>
<td>Identify Components</td>
<td>1, 2, 3, 4, 5, 6</td>
<td>6</td>
</tr>
<tr>
<td>Identify Irrelevancies</td>
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<td>0</td>
</tr>
<tr>
<td>Define Terms</td>
<td>3, 5, 6</td>
<td>3</td>
</tr>
<tr>
<td>Identify Similarities</td>
<td>2, 3, 5, 6</td>
<td>4</td>
</tr>
<tr>
<td>Identify Assumptions</td>
<td>1, 2, 4, 5</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Sub-total</td>
<td>23</td>
</tr>
<tr>
<td>Clarifying Information</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Determining Credibility</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Determining Consistency</td>
<td>1, 2, 4, 5</td>
<td>4</td>
</tr>
<tr>
<td>Recognizing Bias</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Fact/Opinion</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Sub-total</td>
<td>7</td>
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<tr>
<td>Inferring</td>
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<tr>
<td>Interpreting</td>
<td>1, 2, 3, 4, 5, 6</td>
<td>6</td>
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<tr>
<td>Conclusions Follow</td>
<td>2, 4, 5</td>
<td>3</td>
</tr>
<tr>
<td>Generalizing</td>
<td>1, 2, 3, 4, 5, 6</td>
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<td>Drawing Conclusions</td>
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<tr>
<td>Investigating</td>
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<td></td>
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<td>Judging Strategies</td>
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<td>Judging Issues</td>
<td>3, 5</td>
<td>2</td>
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<tr>
<td></td>
<td>Sub-total</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>73</td>
</tr>
</tbody>
</table>
assignments. The fourth writing assignment elicited thirteen critical thinking responses from Diana. It is interesting to note that both of these assignments were dramatic scenarios. With these two examples, one might explain this phenomenon by generalizing that Diana was able to become more involved in the situation when she could project herself into the problem.

In each of the writing assignments (six), Diana used the critical thinking skills of defining questions; identifying distinct components, interpreting and explaining events and ideas, generalizing events and ideas, drawing conclusions, and judging the effectiveness of specific and general strategies. Of the twenty skills, Diana used nineteen of them one or more times. The Analyzing skill of identifying and working with irrelevancies as they appear was not used.

In writing assignment three, which asked students to write and answer a mid-term examination question (a focused writing strategy), Diana concentrated on the topic of two broad theories of teaching reading. She demonstrated her knowledge of the topic which is what the "focused" strategy enables the writer to do.

In the fifth writing assignment, a nutshelling strategy, Diana wrote in generalities but somehow managed to employ twelve of the twenty critical thinking skills. Her comments suggested that she might have been distracted by others in her group. She quoted what others had said, yet she was able to express her own views. In several entries in her journal, Diana wrote of how she enjoyed listening to what others had to say.

That Diana lacks self-confidence is apparent; she readily admitted in the interview, as well as in two of her journal entries, that, "I have a real problem with
self-confidence." Another time she wrote, "I wish that I could develop more confidence in myself. I consider this a serious problem with me." Although Diana is a bright, perceptive young woman, she feels inadequate in stating her opinions orally. Needless to say, she repeatedly wrote of the necessity of allowing "children" to express their views and opinions so that they might develop a better self-concept and so that they would be able to think critically.

In Perry's Scheme of Cognitive Growth, Diana appears to be in Position 4a, Multiplicity Correlate. This position holds that everyone is entitled to his own opinion, thus no one has the right to say that another is wrong. As noted throughout Diana's responses, she expresses her opinions as if they are facts. Facts in quantity are of importance to the student in this position.

Diana's comments and use of critical thinking skills (a total of seventy-three) were some of the best used by the four participants of this study. I constantly wrote encouraging remarks on her journal entries because I sincerely believe she needed this kind of encouragement to develop more confidence in her abilities.
CHAPTER 5

DISCUSSION OF RESEARCH QUESTIONS AND IMPLICATIONS FOR TEACHER EDUCATORS

*How do I know what I think until I see what I say.*  E.M. Forrester

The purpose of this study was to discover the kinds of thinking skills evoked through a series of six writing assignments. Two students (one traditional and one nontraditional) with an A or B grade point average and two (one traditional and one nontraditional) with a C grade point average were selected as participants for the study.

At the end of the semester, each of the four students' writing assignments (six) with my comments were taken from their journals and recorded on computer disks. I found that collating the writings according to assignment provided a more consistent method of examining the students' work. Each writing assignment presented a problem situation.

A list of nonlinear critical thinking skills had been previously organized into four categories (with a total of twenty critical thinking skills), and then coded for ease in indicating students' use of the skills. I read their assignments the first time to establish a general idea of the kinds of responses students wrote in answering the questions. Their responses were reread and coded, and a third reading was done to assess the first coding effort. Next, the critical thinking skills were placed on summary tables for each assignment. This data was then recorded on individual tables for each student. Finally, the writing assignments were read for
the fourth time to recheck the accuracy of the skills that were coded. Information from these tables provided a guideline for answering the research question.

Chapter 5 discusses the thinking skills evoked in the six writing assignments: whether there were similarities in the critical thinking skills of the traditional and nontraditional students; the differences in thinking responses evoked by each of the writing assignments; differences in thinking skills used by the traditional and nontraditional students with a 4.0-3.0 (A or B) grade point average and those with a 2.9-2.0 (C) grade point average; and implications for education.

Thinking Skills Evoked in the Six Writing Assignments

Writing assignment one, a freewriting exercise, evoked more critical thinking responses (forty) than the other five assignments. A combination of nutshelling and dramatic scenario strategies were used in the second writing project and elicited thirty-seven critical thinking responses. Only twenty-seven critical thinking responses were evoked in the focused writing strategy in assignment three. Writing assignment four utilized a dramatic scenario and elicited thirty-two critical thinking responses. In assignment five a nutshelling strategy was used, and thirty-one thinking responses were elicited. The sixth writing was a dialogue between two students, and thirty-two critical thinking responses were evoked. Table 11 depicts a compilation of the critical thinking skills used by the four participants in the six writing assignments.

In writing assignment one, students were asked to write for ten minutes on
# Table 11

A COMPILATION OF THE CRITICAL THINKING SKILLS USED BY THE FOUR PARTICIPANTS IN THE SIX WRITING ASSIGNMENTS

<table>
<thead>
<tr>
<th>CRITICAL THINKING SKILLS</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>TOTALS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ANALYZING</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DFQ   Defining or formulating a question</td>
<td>ABDE</td>
<td>4</td>
<td>ABDE</td>
<td>4</td>
<td>ABDE</td>
<td>4</td>
<td>ABDE</td>
</tr>
<tr>
<td>IDC   Identifying distinct components and terms</td>
<td>ABDE</td>
<td>4</td>
<td>ADE</td>
<td>3</td>
<td>AD</td>
<td>2</td>
<td>ABDE</td>
</tr>
<tr>
<td>IWI   Identifying and working with irrelevancies as they appear</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>A</td>
</tr>
<tr>
<td><strong>CLARIFYING</strong></td>
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<tr>
<td>DCT   Determine credibility of sources</td>
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<tr>
<td>DDI   Determining consistency of information</td>
<td>ABD</td>
<td>4</td>
<td>ADE</td>
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<td>1</td>
<td>ABD</td>
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<tr>
<td>DRB   Recognizing bias</td>
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<tr>
<td>IEE   Interpreting and explaining events and ideas</td>
<td>ABDE</td>
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<td>AD</td>
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<td>AD</td>
<td>2</td>
<td>ADE</td>
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<tr>
<td>DCF   Determining whether conclusion will follow from information given</td>
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<tr>
<td>GEL   Generalizing events and ideas</td>
<td>ABD</td>
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<td>ADE</td>
<td>4</td>
<td>ADE</td>
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<tr>
<td>DCE   Drawing conclusions from events or ideas</td>
<td>ABDE</td>
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<td>ADE</td>
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<td>ADE</td>
<td>3</td>
<td>ABD</td>
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<tr>
<td>DES   Investigating by designing experiments, seeking evidence</td>
<td>ABDE</td>
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<td>ADE</td>
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<tr>
<td>JAI   Judging accuracy and completion of ideas</td>
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<tr>
<td>JVI   Judging the value of ideas and actions</td>
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<td>AD</td>
<td>2</td>
<td>ADE</td>
<td>3</td>
<td>ABD</td>
</tr>
<tr>
<td>IRA   Identifying reasonable alternatives</td>
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<tr>
<td>IRS   Judging effectiveness of specific and general strategies</td>
<td>ABDE</td>
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<td>AD</td>
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<td>ADE</td>
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<tr>
<td>JSW   Judging issues that are strong and relevant or weak and irrelevant</td>
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**TOTALS**

|                  | 40 | 37 | 27 | 32 | 31 | 32 | 199 |

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what they could recall about when they began to read. All of the participants defined the problem and identified the distinct components in their writing. In responding to the problem, none of the students used these critical thinking skills: identifying and working with irrelevancies; defining important terms; identifying similarities and differences; determining credibility of sources; recognizing bias; determining whether conclusions follow from information given (predicting); judging the accuracy and completion of ideas; and judging ideas that are strong and relevant and weak and irrelevant. Only Diana and Bertha used the skill of identifying assumptions and reasons, stated and unstated, in the category of Analyzing Arguments/Issues.

The four participants were able to determine the consistency of information in the category of Clarifying Information in writing assignment one. Diana was the only participant who used the critical thinking skill of distinguishing between fact and opinion.

In the category of Inferring, all of the participants used these critical thinking skills: interpreting and explaining events and issues, generalizing events and ideas, investigating by seeking information, and drawing conclusions from events and ideas. An interesting development in this category was that the four students used all but one of the critical thinking skills. The skill that was not used was determining whether conclusions will follow from information given (predicting).

Two skills in the category of Evaluating Arguments/Issues were used by the four students. These critical thinking skills were judging the value of ideas and actions and judging the effectiveness of specific and general strategies. Annette
alone used the skill of identifying reasonable alternatives. Perhaps she had more academic and personal experiences which gave her confidence to "dare" to state alternatives in problem situations. For instance, she gave an alternative response for Ms. Snyder in assignment two. Judging the accuracy and completion of ideas and judging issues that are strong and relevant were not used by any of the four participants. Nine critical thinking responses were evoked in this category.

The Inferring category elicited more responses than the other three categories. These skills were more applicable for this type of writing assignment because students could generate information about their childhood reading experiences. Generally, the participants used fewer Clarifying of Information skills in their writing assignments. These skills require the consolidation of ideas which would require more time than was given to complete this assignment.

This writing exercise called for students to resort to their individual background experiences in responding to the question. Many students in the class (Reading Process) spoke of this assignment as a difficult one because they had never given any thought to how and when their reading emerged. Flower and Hayes (1981, p 372) remind us that getting information out of long-term memory requires finding a cue that will allow one to retrieve "a network of useful knowledge." In addition they say that reorganizing the information or adapting the information to fit the demands of the rhetorical problem can sometimes fail to meet the need of the writer. This process, it seems, demands more time or perhaps a re-write to sort out and organize information in order to answer the question.

Part I of writing assignment two asked students to read an article, "The Nonconformist," and to state what they thought was the major problem in the
hypothetical reading classroom situation. Part II invited students to participate in a
dramatic scenario by assuming the role of a member of Wendy's immediate family.
This was the favorite writing assignment for three of the participants. It elicited a
total of thirty-seven critical thinking responses.

Diana used fifteen of the critical thinking skills in responding to the
question, while Bertha used only three. Annette was able to use eleven of the
skills, and Elena employed eight critical thinking skills in completing the
assignment.

The four participants were able to define the question and generalize events
and ideas. However, only Bertha did not identify the distinct components in the
problem—to draw conclusions from events and ideas and to seek evidence to
support her claims. In the Analyzing Arguments/Issues category, the skills of
defining important terms and identifying and working with irrelevancies were not
used by the participants. Bertha and Diana identified similarities and differences in
the problem, while Annette and Diana were able to identify the assumptions and
reasons that were stated (or unstated).

Only Diana and Elena used the Clarifying Information skills for writing
assignment one. Neither of these two participants used the skill of determining
the credibility of sources, but both used the skill of determining the consistency of
information. Diana was able to recognize bias in the problem, while Elena was
able to distinguish between fact and opinion in Wendy's dilemma.

Each of the five Inferring skills were used at least once as the participants
wrote their responses to writing assignment two. Diana was the only participant
to predict conclusions, and both Diana and Annette interpreted the events and
issues occurring in the reading classroom.
Diana and Annette used these skills: judging the value of ideas and actions, identifying reasonable alternatives, and judging the effectiveness of specific and general strategies. Annette judged the issues that were strong and relevant, and Diana and Elena judged the accuracy and completion of ideas. The four participants used the critical thinking skills a total of thirty-seven times in responding to writing assignment two. One might generalize when examining their responses that the participants, unfamiliar with classroom management, resorted to making inferences as a means of analyzing the problem.

Writing assignment three elicited the fewest responses of the six writing projects. This assignment asked students to construct a mid-term essay question and to answer their own question. This was a focused writing described by Gere (1985) as one which invites writers to concentrate on a single topic for a specified time. This type of writing, Gere said, enables students to see how much they have to say about a topic.

The skills in the categories of Inferring and Evaluating were used more often than the other two categories (Analyzing and Clarifying). Diana used all but one of the Inferring skills, while Annette used three of these critical thinking skills. Elena and Bertha each used one of the skills. Bertha alone used the skill of determining whether conclusions will follow from information given, while Diana was the only participant to draw conclusions from events and ideas. Annette and Diana explained the issues and investigated by seeking evidence, while all participants but Bertha generalized ideas in responding to writing assignment three.

The category of Evaluating Arguments/Issues elicited nine responses.
Annette, Diana, and Elena used the critical thinking skills of judging the value of ideas and actions and judging the effectiveness of general strategies. Annette and Diana employed the critical thinking skills of identifying reasonable alternatives in their responses. Diana was the only participant who used the skill of judging issues that are strong and relevant. None of the participants employed the critical thinking skill of judging the accuracy and completion of ideas.

Each of the participants formulated a question in the category of Analyzing; however, only Diana defined important terms in writing and answering her essay question. Both Annette and Diana identified distinct components and similarities and differences in their questions/answers. No participant used the skill of identifying and working with irrelevancies or identifying assumptions and reasons. The category of Clarifying information elicited no responses in this writing assignment. Perhaps writing an essay question does not require the use of these skills, and therefore, none of these skills were elicited.

The fourth assignment elicited thirty-two critical thinking responses from the four participants. This writing project called for a dramatic scenario in which the students were to determine important facts that they would need to consider before accepting an invitation to teach a third grade reading class. The purpose of this assignment was to challenge the student to project herself into the role of a college student who is being invited to teach a third grade reading class for one week.

The inferring skills elicited twelve responses. The skill of generalizing events and ideas was used by all of the participants, while Diana was the only one who drew conclusions from the ideas. Annette and Diana used the critical thinking skills of investigating by seeking evidence and determining whether
conclusions will follow from given information. Elena, Diana, and Annette were able to interpret the issues.

In the category of Analyzing Arguments/Issues, the four participants used the critical thinking skills of defining the question and identifying the distinct components. Diana and Bertha identified reasons and assumptions in stating the facts which they would need to know before agreeing to teach the reading class. No one used the Analyzing skills of identifying and working with irrelevancies, defining important terms, or identifying similarities and differences.

One Evaluation skill was not used by the participants in the fourth writing assignment. This skill was judging issues that are strong and relevant or weak and irrelevant. Annette used the skill of identifying reasonable alternatives in responding to the writing assignment. Diana used the critical thinking skill of judging the accuracy and completion of ideas. Diana and Bertha judged the effectiveness of specific and general strategies while Diana, Elena, and Bertha judged the value of ideas and actions.

Three responses were evoked in the category of Clarifying Information. Diana alone determined the credibility of sources and the consistency of information. Bertha was the only participant to recognize the bias in responding to the problem of determining facts that should be known before she would agree to teach a third grade reading class. None of the participants used the skill of distinguishing between fact and opinion for this writing experience.

The fifth writing assignment presented a nutshelling strategy in which students were asked to read the article, “Clever Kanzi,” and to determine if the ape Kanzi was mastering the human language. Kanzi’s experiences with the human language were being analyzed in a scientific laboratory. Nutshelling is a writing
strategy in which students are asked to identify the central ideas of given information (Flower 1985).

The Inferring category elicited eleven critical thinking responses from the four participants. The critical thinking skill of investigating by seeking evidence was not used by the participants. One would expect this skill to be important in the process of analyzing. However, the article did not present a great deal of evidence, and the students might have recognized this fact. However, all participants used the skill of generalizing events and ideas. Annette and Diana used the skills of interpreting and explaining events and ideas and drawing conclusions from events and ideas. Elena, Diana, and Annette employed the skill of determining whether conclusions will follow from the given information.

Ten critical thinking responses in the category of Analyzing Arguments/Issues were recorded in this nutshelling writing assignment. Diana alone used the skill of identifying similarities and differences and identifying distinct components. Annette used the skill of identifying and working with irrelevancies. Diana, Annette, and Elena defined the question for this writing assignment. Bertha and Diana defined the important terms in responding to the problem.

All of the skills in the category of Clarifying Information were used by Annette, while Bertha and Diana joined her in determining the consistency of the information. Critical thinking skills in the category of Clarifying Information were used six times for this nutshelling writing assignment. Writing assignment five elicited more of these skills than the other assignments. Group discussion in this project accounted for the greater number of Clarifying skills generated.
Annette and Diana were the two participants who utilized the Evaluating Arguments/Issues. Annette used the skills of judging the accuracy and completion of ideas and judging the value of ideas and actions. Diana used the two skills of judging the effectiveness of specific and general strategies and judging issues that are strong and relevant. None of the participants used the critical thinking skill of identifying reasonable alternatives. The fifth writing assignment elicited critical thinking skills thirty-one times.

Writing assignment six evoked thirty-two critical thinking responses. The challenge for the students in this assignment was to write a dialogue with a partner in which two persons are discussing or debating the issue of writing to think. Only one skill was used in the category of Clarifying Information; Annette used the skill of determining the consistency of information. The three skills not used by the participants were determining the credibility of sources, recognizing bias, and distinguishing between fact and opinion. The category of Inferring elicited the most critical thinking responses from the participants. All of them used the critical thinking skills of generalizing events and ideas and drawing conclusions from events and ideas. Diana and Bertha used the skill of explaining events and issues, and Annette and Diana employed the skill of investigating by seeking evidence. No one used the skill of determining whether conclusions will follow from given information. Since the students were writing their own scripts, it was not necessary to use these skills. This analysis also applies to writing assignment three in which they wrote mid-term examination questions and they did not use the Clarifying skills.

Thirteen critical thinking responses were produced in the category of Analyzing Arguments/Issues. Annette alone used the skills of identifying and
working with irrelevancies and identifying assumptions and reasons, while Diana was the only participant to use the skill of defining important terms. Annette, Bertha, and Diana used the skills of defining or formulating a question and identifying distinct components. All of the participants used the critical thinking skill of identifying similarities and differences in writing assignment six.

In the category of Evaluating Arguments/Issues, the critical thinking skill of identifying reasonable alternatives was not used by any of the participants. Diana used the skill of judging the accuracy and completion of ideas, while Annette used the critical thinking skill of judging issues that are strong and relevant or weak and irrelevant. Annette and Bertha judged the value of ideas and actions, and Annette and Diana judged the effectiveness of specific and general strategies.

In the category of Clarifying Information, only one critical thinking response was evoked, and that was by Annette when she determined the consistency of the information. The critical thinking skills of determining the credibility of sources, recognizing bias, and distinguishing between fact and opinion were not used by the four participants in writing assignment six.

**Similarities in the Critical Thinking Responses of the Traditional and Nontraditional Students**

There were no outstanding similarities in the critical thinking skills of the two traditional students and the two nontraditional participating students. Both of the nontraditional students in the study were married and had school-age children. Bertha had four children—two are married and are no longer at home, and the other two are teenagers living at home. Their writings were interspersed with comments about the behavior of their children in various circumstances. There
were no notable similarities in Elena's and Diana's critical thinking responses.

**Differences in the Thinking Skills Evoked by Each of the Writing Assignments**

A summary of the differences in the critical thinking skills evoked in each writing assignment follows. Table 11 depicts the number of times each skill was used in each assignment by the four participants in the study.

**Writing Assignment One**

Although this assignment elicited forty thinking responses, students used only twelve of the twenty critical thinking skills. The majority of these skills were used in the Inferring category. In fact, four of the five critical thinking skills in that category were used by the four participants. Only one of the Inferring skills was not used by the students. They used one more skill in the category of Analyzing than in the category of Evaluation. The four students used the first two skills in the category of Analyzing. These skills were defining the question and identifying distinct components. Two of the participants used the skill of identifying assumptions and reasons; and none of them used the skills of identifying and working with irrelevancies and defining important terms. The nature of the question was more personal and open-ended, and the student's threw out irrelevant ideas as they searched their memories.

Only five responses were elicited in the category of Clarifying Information. The four participants used the skill of determining consistency of information; and one student used the skill of distinguishing between fact and opinion. None of the students used the critical thinking skill of determining credibility of sources and
recognizing bias. This writing assignment elicited more responses (forty) than the other five writing projects.

In this assignment it is likely that the problem (rhetorical question) did not generate ideas that were irrelevant, and if it did, students ignored the irrelevancies and wrote only what they could recall. The nature of the question did not call for students to deal with irrelevancies.

The time for writing their responses was limited and writers tended to "throw out" such matters as defining terms and identifying similarities and differences. There was no opportunity to determine the credibility of sources. Recognizing bias was not used because this was not one of the students' problems in their beginning reading. The goal of this writing exercise was to allow students to write freely and to elicit as much critical thinking as possible. Therefore, free-writing proved to be an excellent "beginning" type of writing assignment for this study.

The critical thinking skills of determining whether conclusions will follow, judging accuracy and completion of ideas, and judging issues were not elicited by this assignment. This question asked students to recall what they could about when they learned to read, and these skills apparently did not enter their scheme of thought in solving the problem.

Writing Assignment Two

This writing assignment evoked all but three of the twenty critical thinking skills. Again, more of the skills in the category of Inferring were used than the other categories. All five of these skills were used at least once by the students.

In the category of Evaluating Arguments/Issues, each of the five skills was
used at least once; and five of the seven critical thinking skills were used in the category of Analyzing Arguments/Issues. Only four responses were elicited in the category of Clarifying, and the skill of determining the credibility of sources was not used. A total of thirty-seven critical thinking responses was elicited in writing assignment two.

This assignment (two) challenged students to identify the major problem (as they perceived it) in the classroom situation. Three of the students perceived the problem to be the teacher and her techniques of managing the class. Bertha saw the “environment” as the major problem. The students wrote of how the teacher constantly nagged the children by telling them to “Sh,” “Get in your seats,” and “Sit down.” She did not seem to be aware of her children’s excitement about their art projects, their questions, and their attention span.

These students did not recognize irrelevancies in the article because they were attending to the task of identifying the problem. It was significant that none of the students used or attempted to explain the term “nonconformist.” When the assignment was made to read the article, I deliberately did not explain the term nor did I ask for student responses. Diana and Bertha stated the similarities and differences describing Wendy as the “different child,” but neither of these students used or defined “nonconformist.”

Determining the credibility of the source was unimportant to students as they wrote their responses to the questions. This assignment elicited a variety of responses because of students’ high interest in the content.
Writing Assignment Three

Writing assignment three elicited twenty-seven critical thinking responses with thirteen different critical thinking skills used, and seven thinking skills not used. None of the Clarifying skills was used by the participating students in this writing assignment.

One would expect that these skills would be important in asking and answering questions. This was a focused writing, and fewer responses were elicited from this assignment than from the other five assignments. It is possible that this assignment was too abstract for the students in the class (freshmen and sophomores). They did not have the necessary skills for writing and answering their own essay questions as evidenced by their neglect of the Clarifying skills in answering their questions. At least three of the students considered this to be a mechanical writing assignment (Applebee 1981) because they simply wrote what the book said. They attempted to force an answer.

The categories of Inferring and Evaluating elicited nine responses each. The five Inferring skills were used one or more times, while the Evaluating skill of judging accuracy and completion of ideas was not used by the students.

Analyzing Arguments/Issues elicited nine responses, and two of the critical thinking skills were not used. These two skills were identifying and working with irrelevancies and defining important terms.

The students did not have prerequisite skills to write an essay question, so they relied on experiences they have had with this type of question. Although this is an effective strategy to elicit critical thinking, it requires students to be at a more advanced stage of cognition. I concluded that students will need more training in test writing before they can be expected to use this type of focused writing.
Perhaps another type of focused writing would evoke more critical thinking. For example, the instructor could give students a choice of two or three questions to write their responses for a specified time. If they run out of ideas on one question, they can move on to another (Forsman 1985). Juell (1985) recommends beginning a focused writing with a quotation so that they can agree, disagree or expand their ideas.

Writing Assignment Four

There were thirty-two critical thinking responses evoked from this assignment that asked students to determine the facts which they might need to know before agreeing to teach a third grade reading class. There were fifteen different critical thinking responses used in the writings.

The four participants generated twelve critical thinking responses in the category of Inferring, and they used each of the five skills at least once. There were ten responses evoked in the category of Analyzing. All four of the students used the critical thinking skill of formulating a question and identifying distinct components. The critical thinking skills of identifying and working with irrelevancies, defining important terms, and identifying similarities and differences were not used by the students. Two students used the skill of identifying assumptions and reasons.

Seven responses were elicited in the category of Evaluating Arguments/Issues. The skill of judging issues that are strong and relevant was not used. The other four skills were used one or more times.

The fewest responses for this assignment were found in the category of Clarifying Information. Only three different critical thinking skills were used, while
the skill of distinguishing between fact and opinion was not used by the participants.

This assignment used a dramatic scenario and placed students in a situation where they had to determine what kind of information would be needed before making the decision to teach reading to a group of third graders. They used the skills of analyzing and inferring because they have not had the experience of teaching yet and relied on making inferences and attempting to analyze them.

The class was eager to discuss their answers and were allowed to share their responses in groups of five. Although lack of experience made it difficult for them to write in-depth responses, the four participants used a variety of critical thinking skills in solving the problem.

Writing Assignment Five

There were thirty-one critical thinking responses and eighteen different thinking skills elicited in this assignment. This variety of critical thinking responses represented the participants’ interest and enthusiasm in the writing exercise. Students were challenged to determine whether an ape in a scientific laboratory was learning the human language. Students read an article, “Clever Kanzi,” at the beginning of class and then responded to the question. I hoped that they would use their knowledge of language development in arriving at their decisions.

In summarizing the strategy used in this assignment, invites students to select the central ideas in the given information.

Most of the responses in this assignment were found in the category of Inferring and Analyzing. No one used the Inferring skill of investigating by
seeking evidence, while all of the participants used the skill of generalizing events or ideas. The other three responses were used two or more times. In the category of Analyzing, all of the critical thinking skills were used at least once. Ten critical thinking responses were used in this category.

The smallest number of critical thinking responses was found in the category of Evaluating Arguments/Issues for this writing assignment. The skill of identifying reasonable alternatives was not used, and the other four skills were used one time each.

Diana's diverse use of the critical thinking skills accounted for four of the responses used, while Annette's responses accounted for six of the critical thinking skills used. This was a nutshelling activity in which students responded to an article related to content of the course (Reading Process). The data collected for this study points to nutshelling (with the use of reading related articles) as a strategy for eliciting a diversity of critical thinking skills.

Writing Assignment Six

This assignment asked for a dialogue between two teachers as they discussed or debated the concept of writing to think. A total of thirty-two critical thinking responses and sixteen different critical thinking skills were elicited in this assignment.

The category of Inferring elicited twelve responses. The skills of generalizing events and drawing conclusions were used by all four of the participants. The skill of determining whether conclusions will follow from given information was not used. The remaining two skills in this category were used one or more times.
The dialogue strategy was used in writing assignment six. This strategy was quite successful because each of the four participants in the study considered it a challenge and an opportunity to delineate the concept of writing-to-think. However, I feel that I did not give them enough time to work on this journal writing. Ten, or even fifteen minutes just does not allow students sufficient time to explore or expand the topic. I allowed the students ten to fifteen minutes to discuss (in pairs) and write their responses. I believe more critical thinking would have been elicited with a minimum of twenty minutes allotted for the writing portion of this assignment.

**Differences in the Critical Thinking Skills Used by the Students in the Six Writing Assignments**

Examinations of the critical thinking responses of the four participants revealed these differences in the use of the twenty thinking skills in the six writing assignments:

1. Writing assignment three used the fewest number of responses (twenty-seven), with all of the critical thinking skills in the category of Inferring used at least one time. Thirteen different critical thinking skills were used in this assignment.

2. Writing assignment one elicited the most critical thinking responses (forty) and the least variety (twelve) of critical thinking skills.

3. Writing assignment five elicited the greatest diversity of critical thinking skills. There were eighteen different critical thinking skills used in this assignment while writing assignment one elicited seventeen different skills.

4. Writing assignment four and six elicited fifteen different critical thinking skills.

5. Generalizing events and ideas in the category of Inferring was used in every writing assignment by each student except for writing assignment three in which three students used the skill.

6. Collaborative writing assignments (five and six) appeared to encourage more critical thinking behaviors than individual assignments.
Differences in the Thinking Skills Used by the Traditional and Nontraditional Students with a 4.0-3.0 (A or B) GPA and Those with 2.9-2.0 (C) GPA and Educational Implications

The data from this study shows that the number of critical thinking responses used was greater for high GPA students than for lower GPA students; however, the number of critical thinking responses was the same for traditional and nontraditional students. Table 12 depicts differences and similarities between high/low grade point average students and traditional/non-traditional students.

An examination of the data for this study reveals that high GPA students performed similarly on any writing assignment, while lower GPA students did better on some assignments than on others. It would be over-generalization to assume that a study involving a greater number of students would show that high GPA traditional students would use a greater number of critical thinking skills than nontraditional students; and that the higher the GPA, the greater the number of critical thinking skills used.

Further research needs to be conducted with a variety of writing assignments and employing other strategies in addition to those examined for this study. Such research could make a comparison of the critical thinking skills used in each writing assignment. This would extend my study and assist educators in determining the kinds of strategies that would be more effective and that would apply to their styles of teaching. From the analysis of the data, one might predict that similar results would be found if a follow-up study were conducted with the same students when they reach senior level at the college. The development of cognitive growth can occur when higher education sets appropriate goals to promote cognitive development through its educational curricula (Perry 1981).
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<td>Total</td>
<td>73</td>
<td>32</td>
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</table>

HT - High traditional (Diana)
LT - Low traditional (Elena)
HNT - High nontraditional (Annette)
LNT - Low nontraditional (Bertha)
Critical thinking is difficult to assess. Moss and Petrosky (1983) maintain that multiple-choice or short-answer tests do not provide an insight into the thought processes that are generated in students' responses. Such testing techniques imply that a single correct answer or a best answer exists. Moss and Petrosky point out that "this implication is antithetical" (p 6) to the goals of teaching critical thinking.

Writing is essentially a form of problem solving because writers must deal with a number of constraints such as linguistics, communication, knowledge and context in the process of expressing their thoughts. Fulwiler (1987) pointed out that writing in itself encourages personal reflection and observation and that journal writing helps students think through a topic and to synthesize distinct facts into a logical framework. In the study, journal writing provided a channel of communication between the students and myself. Annette wrote of why she enjoyed writing in her journal; "You get to know us better." Rosenblatt (cited in Arkle 1985) believes that for a classroom to be conducive to creating and enhancing critical thinking, it must be one where students are free to reveal their emotions and to make judgements.

One of the many benefits of journal writing is that it can be used as a tool for identifying students' thinking processes so that, as Fulwiler (1981) stressed, pedagogical approaches can be altered to meet the needs of students. Journal writing blends well with teaching content and can be integrated into all disciplines for the purpose of teaching critical thinking.

**Implications For Teacher Educators**

Students in our schools, colleges, and universities are not encouraged to
think critically as evidenced by studies of the Carnegie Foundation (1985) and the National Assessment of Education Progress (1981). In fact some students prefer a lecture-type class to one where they are asked to participate in class activities. My goal in this study was to evoke the critical thinking skills of my teacher education students; I accomplished this goal by having students write their responses to a series of writing assignments that were designed to elicit critical thinking skills. Journal writing was the vehicle that I used for collecting student’s thinking responses.

I found that a free-writing task which asked students to reflect on their beginning reading elicited the most responses. This activity (writing assignment one) allowed students to reflect on their own experiences and to write their thoughts as they developed. Students were given ten minutes to write, a time that proved adequate for this type of assignment. This was a personal, free-writing task and students used Inferring skills to write about their beginning reading experiences. These skills served to help them interpret, seek evidence, generalize, and draw conclusions about their past. They used fewer Clarifying skills because there was no need for these skills except to determine the consistency of information. I would recommend the use of free-writing strategy in any discipline to encourage students to express themselves freely and, at the same time, to elicit critical thinking skills in the categories of Analyzing, Inferring, and Evaluating.

The nutshelling strategy, used in writing assignment five, was an excellent procedure for evoking a variety of critical thinking skills. The task used in this assignment required students to read a high interest article. Nearly all of the Inferring and Analyzing skills were used by the subjects in this assignment because they were asked to determine whether an ape was learning a language. Students
were asked to work in collaboration with three to five of their peers in responding to the questions in this writing activity; therefore, they found it necessary to analyze the situation and to make inferences in seeking an answer to the problem. Few evaluations skills were used by the students, and they wrote in generalities because they had become bogged down on the meaning of the concept of language. As a result, they expended little time in evaluating the issues.

The student who had problems in reading and the one who had difficulty keeping up with course work were less able to use critical thinking skills in this reading-writing assignment task. I suggest that these two findings be taken into consideration if this type of nutshelling strategy is to be used.

The same consideration could hold true for the nutshelling-dramatic scenario task in writing assignment two. Students were asked to read an article and respond to questions which asked them to decide what the major problem was in a hypothetical classroom situation and to role-play as a relative of the “nonconforming” child in the text. This was a high-interest activity, and my subjects for this study used nearly all of the skills in the categories—Inferring, Evaluating, and Analyzing—in responding to the questions. The skills that were not used in these three categories were not relevant in solving the problems presented in the assignment. This type of nutshelling-dramatic scenario strategy, using a situation that is of great interest to the students, is a great method for eliciting skills in the categories of Analyzing, Inferring, and Evaluating.

The dialogue strategy used in writing assignment six was the favorite of the two C average students. In this task they were given the opportunity to work with a self-selected partner and to write their responses in dialogue form. These two students, as well as the A average students, did not use the Clarifying skills.
because the collaborative assignment did not present a situation that would require them to clarify information. This dialogue strategy could be better utilized for discussing or arguing controversial issues so that students could explore all sides of the issue(s). It requires students to have experienced a great deal of class and group discussions because they benefit from conversations in which they have listened and participated. When using this strategy, I suggest allowing a minimum of twenty minutes so that more and varied critical thinking skills can be elicited as students need time to reflect on past conversations and discussions.

A focusing strategy such as the one used in writing assignment three could have evoked more critical thinking skills of the students if they had been given a choice of the kinds of questions or topics to write about. In this assignment they were asked to write and answer their own essay question; however, fewer critical thinking responses were elicited in this activity than in the other assignments. The students used none of the Clarifying skills because they wrote their own questions and answers which did not require the use of these skills. The same number of critical thinking skills were used in each of the other three categories. Focusing asks the writer to concentrate on a single topic for a specified time, and I recommend that students be given a list of choice of topics and allowed fifteen to twenty minutes to write their responses.

A dramatic scenario such as the strategy used in writing assignment four calls for the writer to project herself into a situation of conflict that has been drawn from some particular subject matter. This strategy is more effective if students have a well-developed knowledge base before attempting this task because, as noted in this study, the students were not able or did not find it essential to use
some of the Analysis skills. However, a variety of inferences were elicited in responding to the task. This strategy is an outstanding method for encouraging students to become actively involved in a rhetorical problem.

Throughout these journal writings, students consistently used a limited number of Clarifying skills, so if these skills are to be elicited, assignments should be prepared that demand clarification. Such writing assignments might be ones that ask students to explain, decide whether given information is based on fact of opinion, and to detect bias and credibility in arguments or issues.

Students wrote of what they were learning about the reading process, and they questioned the information that was not clear to them. Indeed, such writings presented me with an insight into the critical thinking skills they used and the methods and strategies that worked best for them and those that were less effective.
REFERENCE LIST


APPENDIX A

Course Outline and Schedule
APPENDIX A

COURSE OUTLINE AND SCHEDULE

Reading 370
Course Outline

Spring, 1991

Class Schedule and Assigned Readings

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Assigned Readings in Text and Other Readings</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>I. What is Reading?</td>
<td>4-27</td>
</tr>
<tr>
<td></td>
<td>A. Skills Approach</td>
<td>8-14</td>
</tr>
<tr>
<td></td>
<td>B. Language-Experience Approach</td>
<td>16-20</td>
</tr>
<tr>
<td></td>
<td>C. Differences Among Children</td>
<td>23-27</td>
</tr>
<tr>
<td>31</td>
<td>II. Foundations for Reading Instruction</td>
<td>34-65</td>
</tr>
<tr>
<td>February</td>
<td>Elements of Learning</td>
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</tr>
<tr>
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<td>A. Cognitive Domain</td>
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<td>B. Bloom's Taxonomy</td>
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<td>C. Affective Domain</td>
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<td>D. Psychomotor Domain</td>
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<td>A. Language Acquisition</td>
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<tr>
<td></td>
<td>B. Oral Language-First Reading</td>
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<td>C. Language Development</td>
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<td>D. Psychomotor Domain</td>
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<td>7</td>
<td>III. Characteristics of Language</td>
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<td>12</td>
<td>A. Language Acquisition</td>
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<td></td>
<td>B. Oral Language-First Reading</td>
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<td>C. Language Development</td>
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<td>19</td>
<td>IV. Assessment of Prereading SKills</td>
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<td></td>
<td>A. Factors Affecting Performance in</td>
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<td>Beginning Reading</td>
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<td>B. Formal and Informal Testing</td>
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<td>21</td>
<td>V. Beginning Reading</td>
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<td>A. Definition of Readiness Skills</td>
<td>WV Dept of Ed. Handout</td>
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<td>28</td>
<td>B. Approaches</td>
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<td>C. Reading Methods</td>
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<td>D. Writing Assignment 2</td>
<td>“The Nonconformist”</td>
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<td>Spring Break</td>
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<tr>
<td>28</td>
<td>Spring Break</td>
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<td>April</td>
<td>VII. Exceptional Children and Reading Instruction</td>
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<td>Resource Speaker, Professor A. Pauley</td>
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<td>11</td>
<td>VIII. Reading and Nonstandard Speaking Children</td>
<td>510-521</td>
</tr>
<tr>
<td></td>
<td>A. Communicating Across Cultures</td>
<td>510-512</td>
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<td>B. Teaching Reading to Children Who Speak Nonstandard English</td>
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<td>18</td>
<td>IX. Reading in the Content Fields</td>
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<td>A. Expository Text</td>
<td>390-393</td>
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<td>25</td>
<td>B. Structured Overviews and Webbing</td>
<td>393-396</td>
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<td>C. Unit Instruction</td>
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<td>D. Critical Reading</td>
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<td>30</td>
<td>Writing Assignment 4 (A Dialogue)</td>
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</tr>
<tr>
<td>May</td>
<td>X. The Informal Reading Inventory</td>
<td>96-117</td>
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<tr>
<td>2</td>
<td>A. The Four Reading Levels</td>
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</tr>
<tr>
<td>9</td>
<td>B. Limitations of the IRI</td>
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<td></td>
<td>C. Advantages of IRI</td>
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</tr>
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<td></td>
<td>D. Constructing the IRI</td>
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<td>E. Commercially Published IRI</td>
<td>108-110</td>
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<td>F. Administering the IRI</td>
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<td>G. Administering IRI to a Child (Appendix 1)</td>
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APPENDIX B

Student Information Form
APPENDIX B

STUDENT INFORMATION FORM

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<th>Number of Children</th>
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<table>
<thead>
<tr>
<th>Are you living in the same town where you were born</th>
<th>Where else have you lived</th>
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<table>
<thead>
<tr>
<th>Did your mother attend college</th>
<th>Did your father attend college</th>
<th>Are you the first in your family to attend college</th>
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<table>
<thead>
<tr>
<th>If not, list brother and/or sisters who have been to college before you</th>
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<tr>
<th>Your age when you first enrolled in college</th>
<th>Year you returned to college</th>
<th>Year</th>
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<tr>
<th>Are you employed</th>
<th>Full Time</th>
<th>Part Time</th>
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</table>

<table>
<thead>
<tr>
<th>Where</th>
<th>Is your spouse employed</th>
<th>Full Time</th>
<th>Part Time</th>
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<table>
<thead>
<tr>
<th>Other Info</th>
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</table>

This information is strictly confidential. Your names will not be used nor will these data sheets be viewed by anyone but myself (D.S. Baldwin)
APPENDIX C

Interview Questions
APPENDIX C

INTERVIEW GUIDE

Childhood
Did you have a happy childhood? Tell me why you consider this time to have been happy/unhappy.
Did you have any disappointments as a child? What were they?
What kinds of childhood games did you play? With whom?
Do you remember reading as a child?
What kind of books did you read?
Were you read to by your parents or brothers or sisters or other relatives?
What were some of your favorite stories?

Personal Life
Are you married? Engaged? How long have you been married/engaged?
Do you mind telling me your age, month, day, and year of birth?
Do you have children? How many? Ages?
Where do you live?
How long have you lived there?
Is this the same town where you were born?
Do you plan to stay there long?
What other places have you lived?
Are you employed? Where? Part-time or full-time employment?
If married, is your spouse employed? Where
Have you done much traveling? Where?
Did you converse much with your parents as a child? What did speak about?

Friends
Tell me about your friends.
Are they your age?
What kinds of work are they doing?
Are they in college? What are their fields of study?
Are your friends married?
What kinds of entertainment do you enjoy together?
Do you talk much together? What do you talk about generally?
Parents and Siblings

Tell me about your mother.
Did you talk much with her as a child?
Did she read to you? Favorite stories? Why?
How much formal education does your mother have?
Did your mother attend college? Where? Fields of study?
Does she work? What kind of work does she do?
Do you see your mother often?

Tell me about your father.
Did you talk much with your father as a child?
Did he read to you? What kinds of stories?
How much formal education does your father have?
Did your father attend college? Where? What field of study?
Does he work? What kind of work does he do?
Do you see your father often?

Tell me about your brothers and sisters.
How many brothers? How many sisters?
Are they married/single?
How much formal education do they have?
Did they attend college? Did they graduate from a college or university?
Where?
What were their fields of study?
What kind of work do they do?
Do you talk with them often? When?

Did your parents read when you were at home?
Did they encourage you to express yourself verbally?
Did they encourage you to read?
Did they encourage you to attend college?

Goals

What are your goals in life?
What plans do you have to achieve these goals?
Have your goals been altered since you began your college education?
If your goals have changed, tell how.
Tell me about your hopes and dreams for the future.
Education
Where did you go to elementary school? What city? What state?
Describe this school. What kinds of learning experiences did you have.
Where did you attend middle or junior high school? Describe this school.
What kinds of learning experiences were provided?
Where did you attend high school? Did you graduate from this school?
Describe this school? What kinds of learning experiences did you have in
this school?
Do you believe your pre-college education prepared you for college? How?
Do you read often? What kinds of books, magazines, etc., do you read?
Did you have any problems in school with academics? Tell me about these
problems.
What were your strengths? Why?
Were you challenged in any of your classes to analyze and evaluate situations
or occurrences? Tell about these.
Why did you decide to go to college?
Why Bluefield State College?
What area(s) of study have been challenging to you in college?
What area(s) of study have been interesting to you in college?
Would you consider these to be your areas of strength. Explain.
What courses have you taken which you consider required you to think? Why?
What courses have not required much thinking from you? Why?
Have you had the opportunity to analyze and/or evaluate situations or
occurrences in college courses? At home? Tell about these.

The Writing Assignments
Which of the writing assignments did you consider more challenging to your
ability to think? Why?
Which of the assignments did you enjoy the most? Why?
Which did you dislike? Why?
Which of the writing assignments do you believe required more analytical
thinking form you?
Which required more synthesizing of information?
Which required evaluative skills?
Comment on the problem solving strategy discussed and encouraged in this
class? Did you use the strategy in your writing/thinking exercises?
Reactions to Class
What do you consider to have been the greatest strength of this class in the reading process?
What have been some of the weaknesses of this class?
Has your thinking been enhanced, strengthened through the exercises in writing, thinking, and reading in this class? How?
Have you been able to transfer your learning how to think to other classes?
Compare the work which you have done in this class, in regard to thinking, to other classes you have previously taken or are now taking.
Contrast the work done in this class regarding thinking, to other classes you have previously taken or are now taking.
APPENDIX D

WRITING ASSIGNMENT 1

Write what you can recall when you learned to read. Include the situation under which your reading began and tell why you wanted to learn to read.
ANALYSIS OF WRITING ASSIGNMENT 1

This writing activity was designed to encourage students to freely write about the question for ten minutes. I explained to them that their writing would not be graded but that I would write comments in the margins to encourage them to write. The topics, “What is reading?” and “Beginning Reading” had been part of their assigned text readings and group discussions.

Students met in groups of five to share their definitions of reading. Following this sharing experience, they were given a text assignment on “What is reading?” This writing assignment was completed after the group meetings and after they had read the text assignment (an out of class reading assignment). The purpose of this writing assignment was to challenge students to write freely on what they could remember about their early experiences with reading.
<table>
<thead>
<tr>
<th>Participant</th>
<th>Analyzing Arguments</th>
<th>Clarifying Information</th>
<th>Inferring</th>
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<th>Total of Skills Used</th>
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<tbody>
<tr>
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<td>X</td>
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WRITING ASSIGNMENT 2

I. Read the article, "The Nonconformist" by Elise Bell and be prepared to tell what you think is the major problem addressed in the article. Explain why you feel this is the problem by discussing the classroom situation.

II. Now imagine yourself as Wendy's immediate family, i.e., mother/father or brother/sister. Analyze Wendy's behavior as you arrive to take her home from school. Respond in terms of:

   a. what you have learned about human growth and development and what you have learned in your other studies; and
   b. your personal experience(s).
ANALYSIS OF WRITING ASSIGNMENT 2

This writing assignment was designed for both a nutshelling strategy (Part I), and a dramatic scenario (Part II). Flower (1985) described nutshelling as a writing exercise that asks writers to identify the central ideas in given information. She explained that this type of writing enables writers to begin the process of selection. The ability to select central ideas is essential to critical thinking. Part II called for a dramatic scenario, a strategy in which students are asked to respond to a situation of conflict by projecting themselves into the situation in a chosen role.

In this assignment, I hoped students would use their personal and academic experiences in responding to the classroom situation. The article concerned a first grade child, Wendy, who encountered numerous obstacles as she attempted to cope with "free time" before, during, and after her reading group completed their session with the teacher, Ms. Snyder. The stress increased as the day progressed and when Wendy's mother arrived to take her home, Wendy jumped in a mud puddle, shouting to her mother that she hated her. Her perplexed mother asked, "What in the world is wrong with you, Wendy?"

After reading the article, students were faced with the challenge of explaining the major problem(s) in this situation, and to role-play as a member of Wendy's family in interpreting Wendy's behavior.
<table>
<thead>
<tr>
<th>Participant</th>
<th>Analyzing Arguments</th>
<th>Clarifying Information</th>
<th>Inferring</th>
<th>Evaluating Arguments</th>
<th>Total of Skills Used</th>
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</table>
WRITING ASSIGNMENT 3

Write a mid-term examination essay question for this course (Reading Process) and answer your own question.
ANALYSIS OF WRITING ASSIGNMENT 3

Assignment three invited students to concentrate on a single topic for fifteen minutes. This strategy, focused writing, was designed to enable students to see how much they have to say on a subject.

I expected students to select a topic about some aspect of reading about which they felt they knew enough to construct an essay question and to answer their own question. I hoped this writing exercise would evoke at least one or two of the critical thinking skills from each of the four categories—analyzing, clarifying, inferring, and evaluating.

This assignment presented a challenge to the students that many, perhaps, had never encountered, i.e., developing and answering their own essay question.
### TABLE 15

CRITICAL THINKING SKILLS USED BY THE PARTICIPANTS IN RESPONSE TO WRITING ASSIGNMENT 3

<table>
<thead>
<tr>
<th>Participant</th>
<th>Analyzing Arguments</th>
<th>Clarifying Information</th>
<th>Inferring</th>
<th>Evaluating Arguments</th>
<th>Total of Skills Used</th>
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<tr>
<td>Elena</td>
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<tr>
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Critical Thinking Skills

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Totals

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WRITING ASSIGNMENT 4

You have been selected by the principal of Clay Elementary to teach a third grade reading class for one week. This selection is a show of confidence from your performance of tutoring a child in reading at Clay Elementary. What important facts need to be considered by you before agreeing to teach the class?
ANALYSIS OF WRITING ASSIGNMENT 4

This assignment was developed as a dramatic scenario in which students were asked to project themselves into the role of a reading teacher. The challenge was for the student to become involved in an actual teaching experience and to assume the responsibility of maintaining a classroom.
<table>
<thead>
<tr>
<th>Participant</th>
<th>Analyzing Arguments</th>
<th>Clarifying Information</th>
<th>Inferring</th>
<th>Evaluating Arguments</th>
<th>Total of Skills Used</th>
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<td>X        X        X</td>
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</table>

**Critical Thinking Skills**

- OFQ
- IDC
- IVI
- DIT
- ISD
- IAR
- DCS
- DCI
- RCB
- DFO
- IEE
- DCF
- GEI
- DCE
- DES
- JA
- JV
- IRA
- IES
- JSW

**Totals**

- 4
- 4
- 0
- 0
- 0
- 0
- 2
- 1
- 1
- 1
- 0
- 3
- 2
- 4
- 1
- 3
- 1
- 2
- 1
- 2
- 0

**32**
WRITING ASSIGNMENT 5

Please read the article, “Clever Kanzi” to determine if Kanzi has mastered the human language.

Question: From what you have read in this article, and based on your knowledge of language development, do you believe that Kanzi is mastering the human language?
ANALYSIS OF WRITING ASSIGNMENT 5

This was a nutshelling writing assignment, described by Flower (1985) as a strategy that enables the writer to use the process of selection, essential to critical thinking. Students had studied a unit form their text and a handout on language development. They were familiar with some of the characteristics of a language such as the linguists' theory that “language is uniquely human.”

Students were challenged to think critically about a “uniquely human quality” and to determine whether this characteristic might be found in animals.
TABLE 17
CRITICAL THINKING SKILLS USED BY THE PARTICIPANTS
IN RESPONSE TO WRITING ASSIGNMENT 5

<table>
<thead>
<tr>
<th>Participant</th>
<th>Analyzing Arguments</th>
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<th>Evaluating Arguments</th>
<th>Total of Skills Used</th>
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<tr>
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<td>DCF</td>
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</table>

Totals: 31
WRITING ASSIGNMENT 6

Construct a dialogue between two persons in which the concept of writing to think is being discussed or debated.
ANALYSIS OF WRITING ASSIGNMENT 6

This was an assignment in which students were to utilize a dialogue in responding to the problem. Moffett (1981) explained the dialogue as having the advantage of encouraging students to consider different sides of an issue. He concluded that the richness of the dialogue experiences is dependent upon previous points of view which are incorporated from contacts with others and with changing experiences. The class had previously discussed and read in their texts about convergent and divergent thinking. In addition, a handout had been distributed on a five step, problem solving technique (developed by Wales, et al., 1987), and students discussed the steps in groups of five.

The purpose of this assignment was to challenge students to discover the relationship of writing to thinking.
<table>
<thead>
<tr>
<th>Participant</th>
<th>Analyzing Arguments</th>
<th>Clarifying Information</th>
<th>Inferring</th>
<th>Evaluating Arguments</th>
<th>Total of Skills Used</th>
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**Critical Thinking Skills**

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</tr>
</tbody>
</table>
EXAMPLE OF THE CODING OF RESPONSES

Diana's Critical Thinking Responses to Writing Assignment 5

PROBLEM: From what you have read in this article, and based on your knowledge of language development, do you believe that Kanzi was mastering the human language?

Today we discussed a hand-out called, "Clever Kanzi." We got into our groups. Our group believed that Kanzi had a language of his own. By the definition of language (a style of speech or language), Kanzi did not have a language. Kanzi could communicate recognizing symbols, but he could not speak the symbols. Apparently Kanzi was an intelligent ape. I enjoyed listening to the comments that were made. One comment was made that I had never really thought about. Animals have instincts, and humans have the ability to reason. It is amazing to see the difference between animals and humans. I believe that Kanzi could understand what he was being told and to communicate. The lab technicians must have been patient because they did such a good job of training Kanzi. I think I'd like to be there to watch. Just as a baby cannot talk plain enough for understanding, he or she understands what is said and has his or her own way of communicating back. I thought the article was very interesting but I still believe that Kanzi had his own language. It made me wonder about the difference between having a language and communicating in other ways. Everyone had to have an open mind discussing this article. There were conflicting opinions and feelings.
VITA

Dolly S. Baldwin was born in Kimball, West Virginia. She earned a Bachelor of Science degree from Concord College in Elementary Education, with specializations in Art and English for grades 1 through 9. In 1967 she completed her Master of Arts degree at West Virginia University, Morgantown, West Virginia with a specialization in Elementary Mathematics.

Dolly has taught mathematics and reading in grades 6 through 9 in Kimball, West Virginia. She has also taught in self-contained classrooms in Fairfax, Virginia.

Dolly holds membership in the American Association of Colleges of Teacher Education, International Reading Association, Association for Supervision and Curriculum Development, and the National Middle School Association.

At the present time, Dolly is a professor of education at Bluefield State College in Bluefield, West Virginia, where her primary assignment is teaching reading courses. She lives in Athens, West Virginia, with her husband Donald, and son John.

[Signature]

Dolly S. Baldwin