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ABSTRACT

Intended for teachers, this monograph encourages educators to think critically both about critical reading and about what constitutes instruction of critical thinking in schools. The book contains the following chapters: (1) "Crisis in Confidence: The Need for Learner-Centered Schools"; (2) "A Mechanistic World View: Knowledge as Fact"; (3) "An Organic World View: Knowledge as Artifact"; and (4) "Thinking and Reading the Context." Fifty-eight references and an annotated bibliography derived from searches of the ERIC database are attached. (MS)

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Critical Thinking and Reading: Empowering Learners to Think and Act

Allan R. Neilsen
Mount Saint Vincent University

1989

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Contents

Introduction by Jerome Harste

1	Crisis in Confidence: The Need for Learner-Centered Schools	1
2	A Mechanistic World View: Knowledge as Fact	3
3	An Organic World View: Knowledge as Artifact	7
4	Thinking and Reading the Context	13

References 25

Related Sources in the ERIC Database 31

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The photo of John Dewey on the cover was taken at his summer retreat on Sawlor Lake, Hubbards, Nova Scotia. It and the photos on page 30 are used with permission from Special Collections, Morris Library, Southern Illinois University at Carbondale.

Allan R. Neilsen

Allan Neilsen is an Associate Professor in the Department of Education at Mount Saint Vincent University, Halifax, Nova Scotia. He has taught junior high social studies and worked as an elementary reading resource teacher.

Dr. Neilsen's primary professional interests include instructional practices that foster critical thinking in students and alternative approaches to inservice education that foster critical thinking in teachers. He is actively involved in school-based staff development projects that are intended to help teachers better understand and assume greater control of their work in the classroom.

His numerous professional publications and presentations have focused on the reading process, reading and writing instruction, and inservice education.

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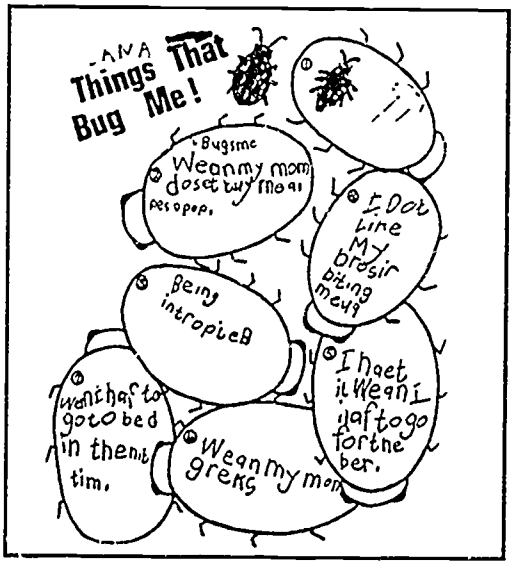
Critical Thinking: A Language Story

After reading *Alexander and the Terrible, Horrible, No Good, Very Bad Day* (Viorst, 1972), Mr. Cochran invited his second-grade students at David Livingston School in Winnepeg, Manitoba, Canada to jot down things that made them have "terrible, horrible, very bad days." Lana's list of "Things that Bug Me!" endorses what writers like Allan Neilsen are telling us about critical thinking in the classroom. Her responses included:

1. [Drawing of a bug]
2. It bugs me when my mom doesn't buy me a Pepsi pop.
3. Being interrupted.
4. I don't like my brother beating me up.
5. I hate it when I have to go for the beer.
6. When my mom drinks.
7. When I have to go to bed in the night time.



Supporting Critical Thinking: Some Literacy Lessons

We call a vignette like this "a language story." (Harste, *et al.*, 1984) Its virtue as a life experience is that it accents some important aspects of language and language learning and therefore helps us understand how language works.

Lana's response to Mr. Cochran's invitation is a particularly good language story because it clarifies:

- basic processes involved in reading comprehension;
- the role that language and other communication systems play in such processes; as well as
- how teachers can support critical reading given these understandings.

Basic Processes in Reading Comprehension

Bateson (1979) defines comprehension and learning as a search for "patterns that connect." From his perspective, "to comprehend" means that what was read "connects," or makes sense in terms of patterns which are known.

Readers often talk about "the click of comprehension." In terms of Bateson's definition, this "click" occurs when readers find parallels between what they know and what the author knows. To fail to comprehend is to fail to find connections between what is read and life experiences. To learn is to create new connections that go beyond and extend what was comprehended.

She has understood the assignment well, too—and has responded quickly and initially with a kind of semiotic wit and a wonderful turnabout on the idiom "bugs me" that brings it home to its probable origin—a high-level response! (It is bugs themselves that bug her.)

Given Bateson's definition, Lana is a critical reader. Not only does her performance indicate that she understood *Alexander and the Terrible, Horrible, No Good, Very Bad Day* but that she can make connections between Alexander's and her own life. Her ability to make such connections indicates that she is involved in the basic processes of comprehension. Her ability to generate a personal list of things that bug her suggests that she has taken ownership of the concept and used it to gain a new perspective on her own life experiences. She has used reading to learn or, in this case, to gain a new perspective on her life experiences. In a sense she has used reading as a way of outgrowing herself. She is a different person as a result of having critically involved herself in reading the book.

The Role Language Plays in Critical Thinking

Lana's list of "Things that Bug Me!" takes your breath away. As educators our first response may well be that no child should have to grow up under such conditions!

Nonetheless, the fact remains that many children in our society do grow up in less than ideal circumstances. To make matters worse, it is this group of children that schools particularly have not served well.

Lana is a Sioux Indian child. She does not speak English as well as her peers nor does she do as well as her peers in school. For these reasons she was placed in a special education setting. Yet, we cannot say, as one Chicago teacher said to me, "Well, Dr. Harste what you say is fine, but the children I teach don't have language."

"Nonsense," I replied and I meant it.

The Lanas of the world do have language. In fact this Lana's invented spellings show that she is an active language user finding patterns that connect between the sounds she hears and the visual letter patterns she has stored in her head as to how English is penned.

What the teacher who made this comment was saying is that she does not value the language that her children bring with them to the classroom. But this must be changed. There is no place to begin other than in terms of what one currently knows. Comprehension and critical thinking begin in the known – in making connections between language and thought.

A teacher in Valparaiso, Indiana, once said to me that what I was suggesting was fine for the children I worked with, but that the children she worked with "did not have experience."

Again, I say, "Nonsense."

What this teacher is saying is that she does not value the experiences that her children bring to school. All children have experience. What we need to learn to do is to value their experiences as we broaden and extend their knowing.

Language allows us to give expression to our life experiences. Once we have named the world through language, our experience can be shared with others, who can learn from the perspective of the person reporting. By beginning new conversations based on various persons' naming of the world, we not only enrich the original text but we distance ourselves from experience and make it an object of inquiry and learning—and of critical assessment.

Lana teaches us much about what childhood is like for some children. We may not like it. We may wish to work on changing conditions that affect her life, but as teachers interested in reading comprehension, critical thinking, and learning, we do not have a choice as to whether we will accept Lana's language or her experience. We must. All learning and thought begin in life experiences.

Insights such as these have clear instructional implications for the need to return to learner-centered teaching. In this monograph, Neilsen sets forth a set of guidelines for the improvement of teaching and learning based on this need.

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Supporting Critical Thinking in Classrooms

Lana's language story illustrates why curriculum must be negotiated. Mr. Cochran's invitation to readers was open-ended. It allowed each student in his classroom to make connections in terms of his or her personal experiences.

Mr. Cochran's invitation is much better than a multiple-choice test in which students are expected to come up with the right response. P. David Pearson says that such tests give students the notion that reading is a process of information transfer rather than a vehicle for critical thinking and learning. Further, he argues that on the average, children answer 47 such items each day they are in school (Pearson, 1989). Given such a diet, no wonder children are not successful on tasks that call for critical thinking.

The authors of *The Reading Report Card* (Applebee, *et al.*, 1985) make the instructional implications clear and provide support for the arguments that Neilsen is making:

> There has been a conceptual shift in the way many researchers and teachers think about reading, which gives students a much more active role in the learning and reading comprehension process. This shift is reflected in changes from packaged reading programs to experiences with books and from concentration on isolated skills to practical reading and writing activities.
>
> Yet, improvement in higher-level reading skills cannot come about simply by an emphasis on reading instruction in isolation from the other work students do in school. To foster higher-level literacy skills is to place new and special emphasis on thoughtful, critical elaboration of ideas and understandings drawn from the material students read and from what they already know. They must learn to value their own ideas and to defend as well as question their interpretations in face of alternative or opposing points of view.
>
> The development of such thoughtful, creative approaches to learning runs counter to much of what students are asked to do in school. Reading in schools is sometimes a relatively superficial activity, a prelude to a recitation of what others have said. Though not optimal, such approaches may be sufficient when teachers are most concerned with the "right" answer and lower-level skills. At other times, reading can be a thoughtful, creative activity, one that challenges students to extend and elaborate upon what others have said or written In developing higher-level reading skills and

> strategies, students will benefit from experience with a wide range of challenging materials. Though there has been considerable concern with providing students with "readable" texts—and a concomitant simplification of instructional materials—this may have inadvertently reduced students' opportunities to develop comprehension strategies for dealing with more complicated material that presents new ideas.
>
> There are opportunities for such experiences in all of the subjects students study in school, as well as in what they read at home. They can learn to develop their own interpretations of what they read, to question, rethink, and elaborate upon the ideas and information drawn from their reading experiences—in conversations with their friends, in discussions with their teachers, and in the writing they do for themselves and others. And in that process, students will also be acquiring the higher-level reading comprehension skills that so many are presently lacking. (pp. 8-9)

While the authors of *The Reading Report Card*, Neilsen, and I cannot guarantee that all children will think critically when given the opportunity to do so, we do maintain that *all* children—including the Lanas we teach—must be *invited* to do so. To do otherwise is to give some students a disabled curriculum and then delude ourselves into believing that they—rather than the educational diet which we provided—are disabled.

Lana's language story and Allan Neilsen's monograph are calls for confidence—in learners and in the learning process, in teachers and in what it is that teachers might do to facilitate language learning. They are open invitations for educators to think critically about critical reading as well as to think critically about what constitutes instruction of critical thinking in schools. Both Allan and I invite you to begin.

—*Jerome C. Harste*
Series Editor

References

Applebee, Arthur, Langer, Judith, and Moll, Inis. *The Reading Report Card: Progress Toward Excellence in Our Schools: Trends in Reading over Four National Assessments*, 1971- 984. Princeton, New Jersey: National Assessment of Educational Progress, Educational Testing Service, 1985.

Bateson, Gregory. *Mind and Nature: A Necessary Unity*. New York: Bantam, 1979.

Harste, Jerome C.; Woodward, Virginia A.; and Burke, Carolyn. *Language Stories and Literacy Lessons*. Portsmouth, New Hampshire: Heinemann, 1984.

Harste, Jerome C., and Stephens, Diane (Eds.) *Toward Practical Theory: A State-of-Practice Assessment of Reading Comprehension Instruction*. (Final Report USDE-C-300-83-0130, Volume II). Bloomington, Indiana. Indiana University, Language Education Department, 1985.

Parker, Franklin. *They All Can Achieve*. Speech given at the Chapter I Parents Conference. Winward School District, Honolulu, Hawaii, 1989.

Pearson, P. David. *Assessing Literacy*. Speech given at the annual meeting of the Utah State Reading Council, Salt Lake City, 1989.

Viorst, Judith. *Alexander and the Terrible, Horrible, No Good, Very Bad Day*. New York: Atheneum, 1972.

Allan R. Neilsen

Chapter 1

Crisis in Confidence: The Need for Learner-Centered Schools

It is then, a sound instinct which identifies freedom with power to frame purposes and to execute or carry into effect purposes so framed.

—John Dewey
Experience and Education (1938)

A number of recent government reports (National Commission on Excellence in Education, 1983) and academic studies (Boyer, 1983; Goodlad, 1984; Sizer, 1984; Smith, 1986) have been highly critical of the quality of public education in America. They voice the concern that many high school graduates haven't developed the ability to think critically. And critical thinking, it can be argued, is essential for responsible, productive participation in society.

"The two fundamental goals of education are personal empowerment and civic engagement. Personal empowerment requires that people be able to think analytically and examine information critically....Civic engagement requires that people learn how to use these skills while taking full part in the life of the larger community." (Boyer in Danner, 1986)

Here I argue that our present education system can do little to foster critical thought because it is rooted in a world view that sees thinking and reading as isolated "skills" that can be transmitted to learners via a teacher-centered pedagogy. We need instead to consider a perspective from which reading and thinking are seen as critical attitudes or states-of-mind that help to shape our daily lives. I also argue that this shift in perspective on thinking and reading must be accompanied by a shift to a more learner-centered pedagogy that provides students with opportunities and incentives to develop critical minds by engaging in projects that are of personal interest and consequence.

Thinking and Reading Critically

Most of us have come to think of critical thinking as the reasoning processes that we use to make judgments and to formulate arguments about the truth, value, or viability of statements, actions, conditions, policies, and even objects. For many of us, critical thinking is the acme or embodiment of rationality reflected in such common statements as "I think your argument has a few problems," "Her efforts were worthwhile," "That's the best solution," "His decision wasn't

fair," and so on. More specifically, we consider critical thinking to include the ability to detect bias, recognize and analyze propaganda, identify logical fallacies, recognize hidden agendas, make comparisons, infer underlying assumptions, and solve problems.

It's probably safe to say that most of us assume that these are the same critical reasoning abilities that we use to interpret editorials, advertisements, memos, proposals, recipes, textbooks, manuals, technical reports, and novels (Durrell, 1956; Russell, 1961; Spache and Spache, 1969; Herber, 1978; Burmeister, 1978; Karlin, 1984).

"Ignorance is not so much not knowing an answer as not knowing there is a question, not being able to think when thinking is required. Ignorance is a blind dependence that someone else will be able to tell you what to do." (Smith, 1983a, p. 1)

It can be argued that these thinking and reading abilities are essential for productive, responsible participation in society because they free us from what Smith (1983a) calls "soft core ignorance" – reliance on others for the answers to our questions, resolutions to our dilemmas and judgments for our controversial issues. From this point of view, criticisms of public education are understandable. If we cannot think and read critically, we cannot be independent of others in thought and action.

My discussion throughout this monograph is based on the assumption that *critical reading is a form or instance of critical thinking* which is consistent with the more general assumption that reading is thinking (Thorndike, 1917).

Robert Ennis ("A Concept of Critical Thinking," 1962) perhaps best represents a subskills approach to teaching and assessing thinking. See Siegel and Carey (1989) for a critical analysis of Ennis' work

Further, I do not see critical thinking and reading merely as aggregations of atomistic skills that belong to some cultural or psychometric "higher order." The subskills position confuses paper-and-pencil performances on narrowly contextualized tasks with the ability or inability to think and read critically. The *ability* to perform in such impoverished situations is not enough. We must also develop what Harvey Siegel (1988) calls a "critical spirit" (p. 23): the *inclination* or *disposition* to think critically on a regular basis in a wide range of consequential circumstances. This spirit cannot be defined by a cluster of skills. It's a way of life.

"Why aren't our schools very successful in teaching students to think and read critically?" Or, less obviously, "Why aren't our students learning how to think and read critically in our schools?" The answer to both questions, I suspect, lies in the world view that underlies our current educational system and the assumptions it holds about the nature of knowledge, teaching, and learning.

Chapter 2

A Mechanistic World View: Knowledge as Fact

From a mechanistic perspective, the world is seen as a system of inert components that operate together in predictable, unchanging ways not unlike the inner workings of a soft-drink machine. Since these components are inert and the relationships within the system are fixed, the system as a whole is in perpetual stasis. It cannot change (except to break down) and cannot grow.

Three fundamental assumptions underlie a mechanistic world view:

- *Reality is objective.* Personal experiences, needs, interests and context are not always acknowledged as influencing our perceptions or interpretations of people, things, or events in the world.
- *Reality consists of discrete elements or building blocks.* People, things, and events tend to be seen as having an identity or meaning that is unconnected to the identity or meaning of other things, people, and events in the world.
- *Reality as a whole can be known or understood by understanding each of its constituent elements.* The identity or meaning of people, things, and events is seen as being equal to the sum of its parts.

It's important to be aware of the assumptions that influence, however unconsciously, how we see and act in the world. More particularly we need to be aware of how these assumptions help to determine the nature of classroom instruction. Teaching is not arbitrary. Pedagogy is at least partially shaped by epistemology.

The concept of objective reality also underwrites the related concepts of "truth" and "fact" – that meanings of things in the world are immutable and can be independent of observer and circumstance. Thus we commonly equate knowledge with facts, skills, and procedures.

Consistent with its apparent assumption that knowledge is a set of cosmic building blocks, the mechanistic paradigm has the tendency to treat thinking and reading merely as rote and ritualistic *forms* of knowledge rather than flexible and generative ways of *forming* knowledge.

Transmission Pedagogy: Teaching and Learning Compliance and Dependence

Teachers who are themselves products of this kind of educational system are likely to perpetuate the cycle of compliance and dependence. If students are given little opportunity or incentive to think critically and act independently perhaps it's because teachers themselves have seldom, if ever, benefitted from such opportunities. (Neilsen, 1989)

Our current educational system has been largely shaped by these mechanistic assumptions. Having subscribed (however unconsciously) to a view that sees knowledge as objective, atomistic, and hence portable, educators have developed a system dominated by a pedagogy which places an overwhelming emphasis on teaching and considerable faith in direct instruction (lectures, readings, and drill exercises) as the chief means of transmitting the facts and skills that students will need to understand in order to operate in the world. This transmission pedagogy assumes that knowledge can be passed along from one person to another "like sums of money or bags of oranges" (Smith, 1983b, p. 195) and that language is "a tube down which knowledge can be sent." (Barnes, 1975, p. 142)

It is also a system in which power and responsibility are centralized in teachers and texts. This follows from the notion that knowledge is a highly valued commodity. Hence those who have knowledge, or who have access to it, have control over those who want it or think they need it. Teachers and texts are seen to be major (and primary) sources of knowledge in school settings and therefore tend to exercise considerable power over the nature and amount of knowledge that will be distributed to learners.

However, when students have little active involvement in the creation of concepts and principles, they often lack the intimate understanding needed to apply or adapt previously acquired "knowledge" to a wide range of new circumstances (A. Neilsen, 1986). This familiar transfer-of-knowledge problem is exacerbated by several factors. First, a mechanistic world view endorses and perpetuates the compartmentalization of knowledge into hermetically sealed disciplines or "subject areas." Second, issues and problems are often presented and studied in a limited range of contexts in schools. Third, many of these contexts are grounded in issues that have little obvious relevance or consequence to students' lives outside school. Collectively these factors tend to discourage the development of multiple perspectives on any given issue or problem for fear of treading on someone else's "territory." They conspire to create the impression in many students' minds that *Oliver Twist*, for example, is just another story. They don't see it as a window on the social, economic, and political conditions that existed in England

during the 1800s or connect it to the plight of homeless people across North America today. That would be considered the domain of history or economics, not English.

As a result, students often have little motivation beyond grades and the vague promise that what is "learned" today will be of value at some time in the indeterminate future. I repeatedly assured my grade eight social studies classes: "You might not be interested in balance-of-trade tables right now, but years from now, when you read the financial pages of the newspaper...." I was naive. Unless instructional contexts allow students access to problems and situations that connect with their current (or foreseeable) lives, our schools

> ...will fail to promote fluidity and complexity in knowing and [will] shut off invitations to make intuitive leaps, to generalize and to make theories about the world outside the physical walls of the classroom. (L. Neilsen, *in press*)

John Dewey (1902/1956) points out the central role of experience and motivation in learning: "An end which is the child's own carries him on to possess the means of its accomplishment. But when the material is directly supplied in the form of a lesson to be learned as a lesson, the connecting links of need and aim are conspicuous for their absence." (p. 25)

This current educational system unwittingly fosters dependence on intellectual handouts and creates students who rely on others not only for answers to their questions but also for the questions themselves. This learned state of dependence is debilitating and potentially dangerous when it comes to making the transition to life outside school. For example, without the ability and inclination to think and read critically, even the most conscientious citizens become vulnerable to the advice of others (however benignly offered) – television broadcasters, newspaper columnists, and public opinion pollsters – to decide what the issues are and how to vote. Often, we don't look to these sources just for information. We actually depend on them to formulate the key issues for us and provide multiple "choices" to guide our decision at the ballot box. And though we should be disturbed about this inability to think and act independently, we shouldn't be surprised. We get as good as we give. Students learn what we teach (Barr, 1974-75).

The Place of Transmission Pedagogy

These shortcomings notwithstanding, transmission pedagogy still serves a useful purpose in our schools. Obviously, there are times when lectures and readings can provide students with the information and perspective they need as background or context for grappling with new concepts and situations. And there are times when students need guidelines and procedures in order to explore issues and resolve prob-

lems. For example, lectures, films, written materials and testimonials can provide information about how to teach science or play the cello; but only experience allows us to transform this information into personal knowledge that actually guides our teaching and performing. Similarly, we do need information from textbooks, television, and newspapers to help us construct our own understandings of events such as the holocaust, prohibition, civil rights, and *perestroika*.

But how far should we go as teachers? When are we helping and when are we hindering? The line between enablement and intrusion cannot be defined precisely because it is constantly shifting according to learners' backgrounds, the task, and situational constraints. Intuition, common sense, and previous experience often provide the most reasonable guidance regarding the teacher's role.

It's important to note that in these cases, teachers and texts do not and cannot convey *knowledge* to students, but instead, provide the *means* by which students can create their own knowledge. Like the miller's daughter in "Rumpelstiltskin," students need to have some straw before they can spin any gold. When used in a supporting or enabling role, transmission techniques are useful. However, when seen as ways to hurry or shortcut knowledge construction, they can create and perpetuate a rather limited if not distorted notion of what our students "know" or have "learned."

The Price of Transmission Pedagogy

In schools where teachers hold power and teaching is the prime concern, students and learning tend to assume relatively minor roles. Compliance, rather than independence, in students' thoughts and actions tends to be valued. And learning tends to be seen in terms of the right answers that students send back up the tube on quizzes, essays, and standardized tests. Under these kinds of conditions, we shouldn't be surprised if students don't develop an extensive repertoire of critical thinking and reading abilities. For the most part, they're not required.

However, when students leave school and are confronted with the myriad of social, political, and economic decisions that affect their lives, they often have few strategies and sometimes little inclination to deal with such decisions. This brings us back to the crux of the issue regarding the quality of public education. How can we better prepare our children for the world beyond the classroom? To begin to answer that question, we need to consider other ways of thinking about the worlds of and beyond school – worlds in which critical thinking and critical reading are valued and cultivated as ways of achieving independence in thought and action.

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Chapter 3

An Organic World View: Knowledge as Artifact

While there are a number of alternative frameworks for thinking about the world, the one that seems most consistent with the goal of personal independence sees the world as a vibrant and ever-changing organism rather than as an inert and static mechanism.

Within this framework:

- *Reality is seen as an indivisible stream of energy or experience.* Thus it cannot be separated into basic building blocks without altering the fundamental nature of that reality.
- *We are all part of that stream and cannot stand outside it.* Hence, there can be no objective reality.
- *All meaning is grounded in context.* People and things and situations exist (they have meaning) only in relation to other people, things, and situations.

As Weaver (1985) points out, this means "There is no sharp division between 'observer' and 'observed,' between 'self' and 'other'." (p. 299)

John Steinbeck (1941, 1979) captures the essence of this world view as he describes the "mental provisioning" that he and Ed Ricketts had for their biological mapping expedition to the Gulf of California in 1940:

> We said, "Let's go wide open. Let's see what we see, record what we find, and not fool ourselves with conventional scientific strictures. We could not observe a completely objective Sea of Cortez anyway, for in that lonely and uninhabited Gulf our boat and ourselves would change it the moment we entered. By going there, we would bring a new factor to the Gulf. Let us consider that factor and not be betrayed by this myth of permanent objective reality....Let us go," we said, "into the Sea of Cortez, realizing that we become forever a part of it; that our rubber boots slogging through a flat of eelgrass, that the rocks we turn over in a tide pool, make us truly and permanently a factor in the ecology of the region. We shall take something away from it, but we will leave something too." (p. 3)

In addition to being a major literary figure, Steinbeck was an amateur marine biologist. His close friend, Ed Ricketts, a professional biologist, was reincarnated as Doc in Cannery Row.

Thus, knowledge doesn't just exist "out there"; it's an artifact of our continuous encounters with the world. During these encounters

Rosenblatt was discovered by reading educators in 1978 with the publication of The Reader, The Text, The Poem *in which she uses the concept of* transaction *to make clear that reading entails much more than the accretion of facts. All reading, she argues, involves some transformation of the reader and the text. Rosenblatt, who was a contemporary and friend of John Dewey, acknowledges his contributions to the development of transactional theory and to her own thinking. (See Rosenblatt, 1985.)*

or transactions (Dewey, 1938; Rosenblatt, 1978) the observer, the observed, and the situation combine to produce meaning that transcends any meaning that might be attributed to them individually. In Rosenblatt's (1985) words: "The human being is not seen as a separate entity, acting upon the environment, nor the environment acting upon the organism, but both as parts of a total event." (p. 98) In fact, it is only in transaction that any of the elements *can* have meaning (Mishler, 1979).

Transaction, Knowledge, and Independence

At first, the notion of transaction might seem to be at odds with the ideal of personal independence. After all, how can we be independent when our existence is shaped by the people, things, and events around us? The key to resolving this apparent paradox lies in the role that experience plays in shaping our view of the world.

If we can accept that our perceptions of the world are rooted in our own experiences and if we can accept these experiences and perceptions as valid, then we have the foundation for creating options with confidence and acting on them with conviction without looking to others for direction and/or affirmation. Instead we become self-directing and self-affirming, which I see as being at the heart of independence. By the same reasoning, we must recognize the validity of the experiences and perceptions of those around us and their right to be self-directing and self-affirming. Thus independence is not only consistent with the notion of the transaction; it is also explained by it.

Since the experiences, interests, and biases that we bring to any situation help to shape the meaning that emerges from any transaction—and since none of us bring exactly the same experiences, interests, and biases to any situation—it follows that no transaction can be the same for any two people. The meaning that emerges, though often apparently very similar and, for many practical purposes, often treated as the same, cannot actually *be* the same. For example, as a Canadian, my reading of *Dispatches*, Michael Herr's evocative narratives of the Vietnam War, (1977) would be profoundly different from that of someone who had been at the Khe Sanh siege in the opening months of 1968. Since the experiences and perspectives we brought to the pages would be different, our transactions would be different, and hence our meanings would be different.

Further, it is important to note that since any transaction becomes part of our experience, it changes both the observer and the observed immediately and forever. Some changes are trivial and hence not visible to the naked eye. Others are profound and affect our beliefs and behavior dramatically. Since we are constantly changing, no transaction can ever be repeated. My three readings of *Zen and the Art of Motorcycle Maintenance*, (1974), for instance, have resulted in three different experiences or meanings for me. First, as a full-time doctoral student preparing for qualifying exams in 1976, I was drawn most strongly by the sense of quest and adventure that Pirsig's journey provided. Next, as the father of a seven-year-old boy in 1985, I was struck most forcibly by Pirsig's not always easy relationship with his son, Chris, who was eleven at the time of the events in the book. And most recently, after spending considerable time over the past five years reexamining my own beliefs about learning and teaching, I found that Pirsig's extended commentaries on classical and romantic world views and his notion of the university as the "Church of Reason" dominated my attention.

Dewey (1938) refers to this relationship between transaction and experience as the principle of continuity of experience which holds that "every experience both takes up something from those which have gone before and modifies in some way the quality of those that come after." (p. 35)

Each time I returned to the text to join Pirsig's Chautauqua, I was a different reader, in fact, a different person. I had participated in a wide variety of transactions that had changed me in ways both great and small.

Thus, from an organic perspective, knowledge is seen not as absolute and immutable but as relative and temporary.

Constraints on Interpretation

Although this transactional view suggests that each of us interprets the world and its texts uniquely, I think we need to guard against interpretive anarchy wherein all interpretations are thought to be equally acceptable. Like Annie Dillard (1982), I'm inclined to believe that "We may well doubt that all things can be known or understood, but we do not really doubt that *some* things can be known and understood – or else we would neither argue nor teach our children." (p. 132)

There *are* limits to the viability or acceptability of the meanings we construct from situations and texts. All of us belong to a variety of interpretive communities (Fish, 1980) which share, to varying degrees, experiences and values that tend to shape, at least broadly, the way we see the world.

These communities, which cut across age, culture, sex, and vocation, tend to develop rules of evidence that result in a range of usual or preferred interpretations of events and texts. Interpretations that fall outside these boundaries are usually considered incomplete, immature, or wrong. Hence, within any interpretive community there are not only limits on what meanings will be accepted but also constraints that tend to shape the meanings that can be constructed.

It is possible, and happens regularly, that a given situation or text will be interpreted differently by different communities. For example Saint Exupery's *The Little Prince* (1971) might be read as a fanciful adventure story by third-grade students and read metaphorically by philosophers as the search for the meaning of life. Which interpretation is right or most acceptable? This, I think, is the wrong question. Instead, it's more appropriate and constructive to ask, "Are these interpretations predictable or understandable given the text, the readers' purpose, and the readers' interpretive community?" To the extent that interpretations vary across communities (and to a lesser extent within communities), meaning is relative. To the extent that the interpretations that can be formed and will be accepted are constrained by the communities to which we belong, meaning is conventional.

Additional constraints are imposed by the genre of a text itself, which to varying degrees can circumscribe relationships between the author and the text, the reader and the text, and the author and reader through the text. Some genres by their nature or intent are more open (Eco, 1979) or more robust (Tierney and Lazansky, 1980) in the sense that they invite or allow a wider range of interpretations than other texts. Literature in general and poetry in particular seem to provide the clearest examples of openness or robustness.

By contrast, there are genres which are less open and hence are less tolerant of diverse interpretations. Research reports and repair manuals tend to require or at least request a reading that more faithfully reconstructs the author's original message. However, the degree to which a text of any genre actually *is* open or closed is always affected by the readers' background, purpose, and interpretive community. For example, members of a gourmet cooking club are likely to treat a recipe for Hollandaise sauce as much more open to variation and experimentation than a novice will. Also, experienced auto mechanics are less likely than their apprentices to be faithful to the lockstep procedures outlined in the shop manuals. Similarly, well- established scientists are

much more able and likely to read beyond the lines of technical research reports than are the undergraduates they teach. However, none of these readers is likely to put livelihood or career in jeopardy by straying too far from what the author has stated or implied.

Transaction Pedagogy: Supporting Learning and Independence

In an education system based on the assumptions of a transformation paradigm, learners and learning become the primary focus of attention. Learning, as the creation of knowledge about how the world works, is seen as something only the learner can do. Teachers and teaching still play crucial but different roles. Teaching becomes a process of providing opportunities for learners to transact in as wide a range of consequential real life circumstances or contexts as possible so that learners can continue to flesh out their world view and add to the repertoire of strategies that they need to become independent in the world. Teachers are seen as collaborators rather than as adversaries. Instead of distributing knowledge, teachers are responsible for helping learners develop strategies for creating their own knowledge.

There are important implications here for professional development education (i.e., inservice). Unless teachers have opportunities to exercise greater control over their professional lives and to work collaboratively with colleagues, it's highly unlikely that they will have the insight or conviction necessary to create conditions that help to empower their students.

Within a system that eschews intellectual handouts, the likelihood of soft core ignorance should be reduced. And since the learner is actively engaged in making rather than taking meaning, problems regarding the transfer of knowledge should also be mitigated considerably. However, transfer will still be a problem if the types of contexts and purposes that shape transactions in schools are restricted (by curriculum guidelines, administrative policies, and resources) and inconsequential to the learner's life beyond the classroom.

Summary of Comparison of How Mechanistic and Organic World Views Help Shape Instruction

WORLD VIEW

	Mechanistic	Organic
Reality	objective building blocks whole equals sum of parts	subjective energy stream whole more than sum of parts
Knowledge	fact absolute immutable	artifact relative temporary
Thinking/Reading	forms of knowledge	forming knowledge

INSTRUCTION

PEDAGOGY:	Transmission	Transaction
Teacher	distributes: knowledge power	collaborates: knowledge power
Learner	receives: conventional wisdom	constructs: personal knowledge
Instruction	teacher/teaching lecture/reading/drill	learner/learning inquiry
Costs	lack of transfer dependence compliance	time energy hard to evaluate
Benefits	efficient easy to manage easy to evaluate	transfer independence questioning

Chapter 4

Thinking and Reading the Context

From a transactional point of view, thinking and reading can be seen as meaning-making processes rather than constellations of atomistic skills. They become means that empower us to construct (rather than acquire) the rules or conventions that we need to operate effectively and independently in the world. These rules and conventions derive meaning and power from the contexts in which they are embedded and serve to guide our expectations and actions in these contexts. For example, they tell us when to wear a shirt-and-tie instead of jeans, when to look for a new job instead of applying for a promotion, when to laud Colonel George Armstrong Custer as a martyr rather than vilify him as a racist.

Similarly, we learn (that is, we construct the rule) that "Once upon a time...." indicates that the author is about to tell us a story in which good will ultimately prevail over evil and lead us to some insight about the nature of life. We also learn that when an author tells us "I have several serious reservations about the free trade pact between Canada and the United States...." that what will follow is likely to be some list of arguments intended to persuade us that the free trade deal is inequitable and should be abandoned or at least modified. What's important to realize about these rules or expectations is that they can only be learned or constructed through reading and writing a wide variety of texts over time. We learn about conventions by using them to meet specific needs or purposes. Telling learners about the conventions of texts isn't sufficient.

"We should expect [students] to learn more while being taught less. Their personal engagement with their own learning is crucial, adults cannot 'give' them an education. Too much giving breeds docility...." (Sizer, 1984, p. 34)

From this point of view, reading the context becomes a fundamental dimension of critical thinking and reading because it establishes what subsequent thought and action are necessary or most appropriate. In problem-solving, the most difficult and most crucial aspect of the process is formulating what the problem *is* – understanding what is being asked. Once that is determined, the solution or path to the solution often becomes "obvious."

This suggests that if we want good thinkers and readers, we need to help them learn how to determine what the problem or situation is asking of them rather than focusing almost exclusively on procedures for arriving at answers. Knowing how to find answers will

make little sense and hence never become part of their knowledge base unless learners understand what is being asked and why it is important. This, in turn, underscores the importance of students having some input in the problem or task being addressed. Without the vested interest that comes from having genuine input in an enterprise, students might be *able* to complete critical thinking and reading tasks *in school* but never develop Siegel's (1988) critical spirit that *disposes* or *inclines* them to think and read critically in *all aspects of life.*

Furthermore, from this perspective, *all* thinking and *all* reading are critical when they are consequential for our successful functioning in the context(s) of the world. Thinking and reading that do not have consequences in terms of knowledge construction are at best information-gathering activities. At worst, they become political exercises in which we merely comply with the wishes and direction of others in order to get by and stay out of trouble.

Implications for Reading Instruction

Smith warns us that demonstrations are in the eye of the beholder. We can't assume that the demonstrations we offer consciously will have the influence we intended. Conversely, it's often the case that we provide demonstrations that weren't intended (and of which we are usually unaware). The clear implication is that we need to monitor what we say and do more carefully because of the powerful influence that our demonstrations exert on the beliefs of those around us.

Several studies (Rhodes, 1979; DeFord, 1981, 1985; Siegel, 1983; Rowe, 1985; Stephens and Clyde, 1985; Proctor, 1986; Huestis, 1987) have demonstrated quite clearly that learners' beliefs about the purpose and nature of literacy are shaped by teachers' beliefs and instructional practices. What we say, and more importantly, what we do in the classroom "demonstrates" (Smith, 1983c) to students what we believe about reading. It tells them what counts as reading and thereby what they should do in order to be considered good readers. For example, when we insist on word-perfect oral rendering of texts, we "tell" students that reading is largely a mechanical word-calling performance and that if they want to be good, they must learn to recognize or sound out the words. When we ask students to engage with texts inhabited by sanitized characters acting out life in idealized circumstances, we go some distance toward convincing them that reading is "nonsense" (Smith, 1985). And when we reject or trivialize students' responses to a novel, poem, or geography text because they don't match the ones in our heads or in the teacher's guide, we indicate to students that meaning resides in the text and that their interpretations aren't really valid (or valued).

Thus the context has a profound effect on how we read any text in that context (Carey, 1982; Smith, Carey, and Harste, 1982). And students do learn to read these signs very early in their school lives and

do learn to think and act within the limited possibilities circumscribed by these signs. This is well documented in the substantial body of literature on teacher expectation. (See Braun, 1976, 1987 for reviews of this work.)

Given that context does help to shape our students' beliefs about the world in general and about reading in particular, it's important for us as teachers to become aware of our own beliefs and to monitor the demonstrations or signs that we are providing for our students. If we believe that reading is an epistemic or meaning-making process; if we believe that meaning is derived from transactions among reader, text, and context; and if we believe that reading is a consequential rather than trivial undertaking – then we need to demonstrate these beliefs clearly through the types of learning opportunities we provide for our students. The following guidelines should help to provide the kinds of opportunities and demonstrations that will empower students to become more independent as thinkers, readers and learners.

1. Allow learners to be actively involved in the learning process.

We need to provide students with opportunities to become actively involved in constructing their own knowledge for their own purposes. Drawing on the work of C.S. Peirce, Kathy Short (1985) describes three types of transactions that can lead to the construction of new knowledge. *abduction, deduction, induction.* First, through *abduction,* we unconsciously formulate "best guesses" or hunches or hypotheses to account for surprises or anomalies that we encounter in the world. Unknown words, missing information, unusual formats, misleading titles, and unfamiliar genres are examples of anomalies we must resolve in order to make sense or make meaning when we read.

Peirce's use of the terms abduction, deduction *and* induction *are unconventional and therefore often confusing. Siegel and Carey's (1989) discussion and examples help clarify Peirce's meanings.*

Anomalies and abduction. Some anomalies create disturbances that are much more difficult to resolve because they challenge long-held beliefs and assumptions about the world. For example, as I was driving our nine-year-old son David and two of his friends home from basketball practice, CBC radio broadcast an interview with Bernard Ominayak, a Cree chief from Alberta whose band was involved in a land dispute with the Canadian federal government. Ominayak said his people were prepared to block all entry to the disputed area unless the government recognized their claims and began immediately to negotiate in good faith. Before the interview was over, one of the boys

blurted, "He's an Indian?" Someone else added, "How come he didn't say, 'Me Indian. Me want land.'?" Unfortunately, their concept of aboriginal people was based on the caricature fostered by dated history texts, museum visits, and television dramas and had not been challenged or modified by contact with the contemporary life and concerns of these people.

Anomalies must be perceived as anomalies by the learner before any change or growth can occur. This point is subtle, but its significance for learning and teaching can be seen in our younger son's early concept of "six." When Jesse was twenty-one months old, he was given a set of "Sesame Street" alphabet and number cards. He learned to recognize the numeral *6* and to say "Six" whenever he saw it. Almost immediately, however, "six" became his generic reference for written symbols – numbers, letters, words, sentences. For Jesse, the differences between *6* and *A* and *Cheerios* did not represent anomalies because they didn't represent conceptual inconsistencies. Only when they began to create problems of reference and meaning did he begin to differentiate among them. Thus, parents and teachers cannot create anomalies on behalf of children. They can only create situations in which anomalies might emerge in the minds of children.

Deduction. Next, through *deduction*, we make predictions about what should follow from our hunches or hypotheses if they are accurate. Obvious examples of this kind of prediction are our guesses about how character conflicts will be resolved in a novel and our efforts to determine a writer's agenda from her opening line.

When we continually preempt or resolve anomalies for students, we foster compliance and dependence which, in turn, serve as the foundation for soft core ignorance.

Induction. Finally, we need to test the viability of our hypotheses against actual experience by reading to confirm, reject, or modify original hypotheses. Did Archie Costello and the Vigils finally get their just reward in *The Chocolate War*? Was the writer actually sympathetic to the Russian soldiers "trapped" in Afghanistan or was she playing devil's advocate? This third type of transaction Peirce calls *induction*.

As a result of engaging in these processes, learners are able to construct the rules and conventions they need to operate in a wide variety of reading contexts. However, for this knowledge to be authentic, the learner must be in control of each aspect of the process. When we tell students the author's purpose or what meanings to find or what questions to ask when they read, we often preclude the possibility of important anomalies presenting themselves. This approach tends to discourage many divergent, surprising, and insightful interpreta-

tions of texts. While these lost opportunities might seem to be rather benign if not inconsequential, they contribute to a state-of-mind that makes our students vulnerable to the persuasions of others. As Douglas Barnes (1988) reminds us:

> If we wish to educate young people to take their place as adults, there can be no justification whatsoever in presenting them with other people's accounts of the world without giving them some access both to how those accounts were arrived at and to some of the possible alternative accounts and how they too might be justified. A "critical" curriculum provides the only way of both avoiding indoctrination and recognizing that all knowledge is provisional (p. 27).

Like the grains of sand that are necessary for natural pearls to form, anomalies are essential for the construction of personal knowledge. Without anomalies, the hypotheses, predictions, and tests necessary for the formation of personal knowledge cannot occur because we've already told students what they should find, all that's left for them to do is "search-and-destroy" the text until they find it.

When we say to students "Read this to find the three reasons why Rachel left home even though her mother was dying," we tend to prescribe the anomaly and its (intellectual) resolution in advance. On the other hand, when we say "As you read this account of Rachel leaving home, jot down any questions and feelings it raises," we allow each reader to encounter and resolve his own anomalies.

In these situations the best we can hope for is that students will become adept at discovering the meanings we want and at solving the problems we pose. But as Sternberg (1985) points out, this isn't enough if we want our students to become independent learners. "Students need help in recognizing problems, not just in solving them....Training students to solve problems already posed for them does not train them to find and select important problems on their own." (pp. 195-196)

In fact, schools can actually make students functionally blind to anomalous situations by doing all their seeing for them. When questions always originate with the teacher (or with a publisher) and when the resolutions and answers are always the ones sanctioned by the teacher (or instructor's manual), there is little incentive or opportunity for students to develop the critical spirit and become independent learners. The learner is like a low-ranking civil servant relegated to carrying out policy rather than helping to create policy.

When we measure what has been "learned" under conditions like this, we often get performances on multiple-choice tests, essays, research projects and lab reports that look strikingly like the "real thing." However, when learners are not required to formulate their own questions and hypotheses nor to make and test their own predictions, the performances we see represent a very limited kind of learn-

School knowledge can be seen as a by-product of the "hidden curriculum" (Barnes, 1975; Giroux, 1988)—that unspoken and largely unconscious set of rules and expectations regarding what is right and who is in control which is conveyed and operates through a myriad of subtle demonstrations (e.g., grading practices) and not so subtle demonstrations (e.g., classroom management).

ing that results in "school knowledge" rather than personal or "action" knowledge. Barnes (1975) makes a useful and intuitively familiar distinction between the two:

> School knowledge is the knowledge which someone else presents to us. We partly grasp it, enough to answer the teacher's questions, to do exercises, or to answer examination questions; but it remains someone else's knowledge, not ours. If we never use this knowledge, we probably forget it. In so far as we use knowledge for our own purposes, however, we begin to incorporate it into our view of the world, and to use parts of it to cope with the exigencies of living. Once the knowledge becomes incorporated into that view of the world on which our actions are based...it has become "action knowledge." (p. 81)

2. *Provide consequential contexts for learning.*

In order to gain and retain control of the learning process, students need to have much greater choice of what they read, why they read, and how they read. If students have the opportunity to select materials that are grounded in their own experiences and interests, if they have the chance to seek out information that they need in order to make decisions of personal or community-wide consequence, and if they are allowed to act on their interpretations of what they have read, then authentic knowledge can emerge.

For his sixth birthday, our son David received his first plastic model kit. It was a hi-tech space robot with over 300 pieces, most of which were required to move *after* gluing. Naturally, there were instructions, lots of them. And despite his limited sight vocabulary and primitive word attack strategies, David succeeded in building mighty "Megatron."

What struck me as I watched him was how he resolved the anomalies that he encountered in the diagrams and written directions. He didn't know all the words, but he didn't need all the words. His chief resources were interest and his knowledge of the genus (Transformers) to which Megatron belongs. David encountered uncertainties and frustrations (directions and even diagrams are often not as clear or accurate as they first appear); but he also gained a new understanding of how Transformers "work" and learned something about the conventions and vagaries of "plastic model instructions."

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While this example is scar ly unique, it is instructive because it shows what can happen whe: rners have a vested interest in what they are doing, when the ano. lies, hypotheses, and tests are their own. Abundant additional evidence of the importance of this kind of vested interest can be found in the familiar cases of junior and senior high school students who can't connect with Math 300 or Robert Frost but do build their own stereo systems and read the political and social commentary in *Rolling Stone* magazine.

I'm not suggesting that we ground our curriculum in items from the Sears catalogue or drugstore magazine racks, but I am suggesting that we can create environments in which students have many opportunities to encounter anomalies of their own and to resolve them on their own terms. Without an active part in the generation of knowledge about how texts and reading work, learners will likely find it difficult to apply the rules, conventions, and procedures provided by the teacher in new or unfamiliar contexts. In other words, transfer of knowledge across classrooms and beyond the school probably will be limited.

3. Provide a supportive learning environment.

When I say that students need opportunities to encounter and resolve anomalies on their own terms, I don't mean they should be left on their own, unsupported. Teachers have a crucial, if difficult, role to play in helping students to become self-reliant rather than other-reliant as learners. The crucial dimension of this role is to help students learn how to identify and solve problems that are of interest or of consequence in a wide variety of contexts. Baker and Brown (1984) capture the essence of this instructional relationship:

> The current interest in dynamic learning situations has seen a move away from experimenter-controlled, or teacher-controlled, instruction of the traditional kind towards a concentration on interactive processes. It is through interactions with a supportive, knowledgeable adult that the student is led to the limits of her own understanding. The teacher does not tell the student what to do and then leave her to work on her own unaided; she enters into an interaction where the child and the teacher are mutually responsible for getting the task done. (p. 382)

Writing conferences (see Atwell, 1987; Calkins, 1986; Hansen, 1983), in which teachers help students learn to think critically about the stories and reports they are creating, exemplify current attempts to have students assume greater control and responsibility for their own learning.

In short, the teacher's responsibility is to help students learn how to learn.

To this end, the teacher needs to adopt a forward-looking perspective from which she constantly seeks to help students stretch or extend the boundaries of their knowing and understanding. Rather than remaining focused on what learners already know and can do by themselves, the teacher attempts to consider students' zone of proximal development which Vygotsky (1978) defines as "the distance between the actual development level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers." (p. 86) In other words, the teacher needs to be sufficiently aware of his students' experience, needs, and abilities so that he can understand not only what they know now but also what they *could* know with his guidance and support.

For growth to occur, therefore, instruction must help students move beyond what they already know and can do independently to encounter and grapple with new tasks and new situations. Therefore, it is not only important for students to use familiar text materials to solve familiar problems; it's also important for them to encounter unfamiliar materials and resolve new problems. For example, history texts can be useful (and comfortable) for many school-based tasks; but newspapers, archival materials, and government documents also represent potentially useful resources for learners both in and out of school. It's not enough for the teacher to tell students that these resources exist or where to find them; she needs to help students discover how they "work" (about their structural properties) and when to use them (their purposes). Similarly, SQ3R (Survey, Question, Read, Recite, Review) is a study strategy that can be of some use in some circumstances but not in others. Again, it's important for the teacher to help students learn how to "debug" or modify these kinds of algorithms when texts are poorly written and when to discard them in favor of alternative strategies when the format or genre or purpose for reading changes.

SQ3R might be quite useful with a well-written science or history text but quite ineffective with a magazine article or technical manual. Knowing when (and when not) to use this type of formula is a good example of critical thinking as the ability to read the context.

In both examples, knowing the learner and knowing the contex helps the teacher provide a learning environment in which anomalies can be encountered and resolved on the learners' own terms. Given this type of environment, opportunities for growth in independence are increased.

One of the most disturbing interpretations of learner-centered education is the one which sees any action on the part of the teacher as interference with the student's right to be independent and to determine her own destiny. When accepted uncritically, this notion can cause teachers to feel sufficiently guilty or at least sufficiently uncertain about their role to become paralyzed into inaction. They not only "back off" for fear of being interventionist, but in effect, often back right out of the classroom (L. Neilsen, 1986).

On the other hand, there are those blithe spirits who suffer no such guilt or uncertainty. Philosophically, they are only too willing to "set their children free." In either case, unless students have some strategies for creating order and predictability in their school environment, they can be left in limbo, a condition that does not always foster independence.

There is often a fine line between empowerment and abandonment. It's not enough to provide students with opportunities to assume greater control and responsibility for their learning. We must also help students to recognize and act on these opportunities. This means providing active support and leadership to students who are unaccustomed to having choices and making decisions.

Independence is learned; it doesn't just "happen" by leaving students on their own. During the initial exploration of any new region of the proximal zone, it is likely that the teacher will need to be quite actively involved in helping learners identify consequential issues, problems, and tasks and in helping develop effective strategies for examining the issues, solving the problems, and completing the tasks.

As an experienced reader and collaborative learner, the teacher can suggest or demonstrate alternative ways of transacting with texts. This support or scaffolding (Bruner, 1978) that the teacher provides is important because it helps the learner to develop a repertoire of strategies that he can use on his own in future circumstances.

Scaffolding must be done skillfully. There is always a danger that the teacher will retain control of the goals, strategies, and outcomes rather than encouraging and helping the learner to assume responsibility for them. The line between support and domination of the learning process is often difficult to discern, but at some point we have to ask ourselves who's in charge of the learning or, as Dennis Searle (1984) puts it, "Who's building whose building?"

4. Provide opportunities for learners to collaborate.

Another important source of support comes from peers. By working through problems and issues together students can benefit from one another's questions, suggestions, hypotheses, insights, feedback, successes, and failures. In fact, Vygotsky (1962, 1978) has argued

that this kind of social interaction is essential to the development of individual thought.

Furthermore, in an environment that encourages and rewards collaboration rather than competition, students are more likely to take risks as thinkers, as readers, as decision makers. Unfortunately, in some classrooms, collaboration is neither encouraged nor rewarded. A macho "survival-of-the-fittest" ethic often seems to prevail (regardless of the teacher's gender); and far from being seen as a legitimate, powerful, and inevitable way of constructing personal knowledge, collaboration is often seen as illegitimate, weak, and preventable. At best, it is sanctioned for tasks that will not be graded or for tasks that aren't particularly consequential even if they are graded. At worst, it is seen as a form of cheating. Decisions that are made by individuals and made alone are often the most highly valued. That's unfortunate because, as Sternberg (1985) reminds us:

> Many everyday problems are not usually—indeed cannot be—solved individually. At work, committees, task forces, and consortia of various kinds are regularly formed to solve problems. At home certain decisions require input from the entire family and rightfully require a group decision-making process. But groups are susceptible to a large variety of biases in problem solving and decision making, and solving problems *individually* does not prepare one to deal with these sources of bias. (p. 198)

Belief in the social construction of knowledge is reflected extensively in current accounts of successful collaborative classroom practices such as peer tutoring, peer editing, group projects and dialog journals. (See Harste, et al., 1988; Fulwiler, 1987.)

Collaboration is not incompatible nor philosophically inconsistent with the ideal of personal independence. In fact, if we accept that meaning is created not just subjectively but intersubjectively through social interaction, then collaboration provides a necessary condition for becoming independent. To say that someone is independent is not to say that he is not influenced by the people and events around him. Quite the contrary. We learn how to respond (and how not to respond) to any given task or situation by watching how those around us respond to them – from the intended and unintended demonstrations (Smith, 1983c) provided by others. Furthermore, our decisions are influenced by the opinions, advice, and experiences of those around us. However, collaboration does not imply the need for consensus or compliance. Instead, it suggests the opportunity to develop strategies, options, and, with time and experience, the confidence and inclination to take independent action based on informed choices.

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Reexamining the Present; Looking Toward the Future

These guidelines are scarcely new; sensitive, sensible teachers and parents have been using them for years. However, if we share Dewey's (1938) "sound instinct" (p. 67) that independence comes with the ability to frame our own purposes and act on them, and if we believe that independence is necessary or desirable for responsible, productive participation in society, then I think many more of us need to reexamine the assumptions underlying our instructional practices.

Instead of concentrating our efforts on transmitting information, skills, and procedures to students, we need to consider the potential long-term advantages of helping them to develop for themselves the strategies, judgment, and confidence they need to become self-reliant thinkers, readers, and learners.

To do this, we will need to reconceptualize and recontextualize the nature of curriculum, learning, and instruction. Curriculum must be seen more as the mental trip (Harste, Burke, and Woodward, 1984) we take during our transactions with the world and less as a mere aggregation of separate and separable knowledge domains. From an organic-transactional perspective, there is no more reason to separate knowledge into discrete domains with the hope of understanding the world than there is to take a cup of water from Lake Ontario with the hope of divining from it the power and majesty of Niagara Falls.

We need to begin to think of learners not as blank slates or empty vessels that we are responsible for filling with *our* understanding of the world, but as individuals who are constantly constructing knowledge in an attempt to expand and clarify *their* understanding of the world.

Further, since the learner is the only one who can construct knowledge, we need to shift our teaching emphasis from transmitting conventional knowledge to supporting the construction of personal knowledge.

And, given that meaning is constructed subjectively and is shaped by the contexts in which transactions take place, we need to reexamine the traditional notions of truth and fact, right and wrong as ways of measuring growth and judging performance. Instead, we need to consider what growth is "reasonable" and what performance

is "appropriate" in light of the learner's background, the source and type of task, and the nature of instruction.

Finally, if we really are concerned about our children being able and willing to participate intelligently and effectively as citizens in our collective future, then we will have to stop thinking of critical thinking and critical reading as subject matter that can be packaged, taught, and tested. We need instead to start thinking of them as attitudes and inclinations toward the world that need to be encouraged, nurtured, and lived.

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References

Atwell, Nancie. *In the Middle: Writing, Reading and Learning with Adolescents.* Portsmouth, New Hampshire: Heinemann, 1987.

Baker, Linda, and Brown, Ann. "Metacognitive skills and reading." In P. David Pearson (Ed.), *Handbook of Reading Research.* New York: Longman, 1984.

Barnes, Douglas. *From Communication to Curriculum.* Markham, Ontario: Penguin Books, 1975.

Barnes, Douglas. "Knowledge as action." In M. Lightfoot and N. Martin (Eds.) *The Word for Teaching is Learning.* Portsmouth, New Hampshire: Heinemann, 1988.

Barr, Rebecca. "The effect of instruction on pupil reading strategies," *Reading Research Quarterly, 19* (4), 1974-75, pp. 555-582.

Boyer, Ernest L. *High School: A Report on Secondary Education in America.* New York: Harper and Row, 1983.

Braun, Carl. "Teachers' expectations." In Michael J. Dunkin (Ed.), *The International Encyclopedia of Teaching and Teacher Education.* Toronto: Pergamon Press, 1987.

Braun, Carl. "Teacher expectations: Sociopsychological dynamics," *Review of Educational Research, 46* (2), 1976, pp. 185-213.

Bruner, Jerome S. "The role of dialogue in language acquisition." In A. Sinclair, R.J. Jarvelle, and W. J. M. Levelt (Eds.), *The Child's Concept of Language.* New York: Springer-Verlag, 1978.

Burmeister, Lou E. *Reading Strategies for Middle and Secondary School Teachers.* Reading, Massachusetts: Addison-Wesley, 1978.

Calkins, Lucy. *The Art of Teaching Writing.* Portsmouth, New Hampshire: Heinemann, 1986.

Carey, Robert F. "Meaning in context: The semiotics of literacy." Paper presented at the Annual Meeting of the International Reading Association, 1982.

Carey, Robert F. "Knowledge as transaction: Epistemology as a socio-cognitive process." Paper presented at the Annual Meeting of the National Reading Conference, 1984.

Danner, Mark (moderator). "How not to fix the schools: Grading the educational reformers," *Harper's Magazine, 272* (1629), February 1986, pp. 39-51.

DeFord, Diane E. "Literacy: Reading, writing and other essentials," *Language Arts, 58* (6), 1981, pp. 652-659.

DeFord, Diane E. "Validating the construct of theoretical orientation in reading instruction," *Reading Research Quarterly, 20* (3), 1985, pp. 351-367.

Dewey, John. *The Child and the Curriculum.* Chicago: The University of Chicago Press, 1902, 1956.

Dewey, John. *Experience and Education.* New York: Collier Macmillan, 1938, 1963.

Dillard, Annie. *Living by Fiction.* New York: Harper and Row, 1982.

Durrell, Donald D. *Improving Reading Instruction.* New York: World Book Company, 1956.

Eco, Umberto. *The Role of the Reader: Explorations in the Semiotics of Texts.* Bloomington, Indiana: Indiana University Press, 1979.

Ennis, Robert. "A concept of critical thinking," *Harvard Educational Review, 32* (1), February 1962, pp. 81-111.

Fish, Stanley E. *Is There a Text in This Class?* Cambridge, Massachusetts: Harvard University Press, 1980.

Fulwiler, Toby (Ed.) *The Journal Book.* Portsmouth, New Hampshire: Boynton/Cook, 1987.

Giroux, Henry. *Teachers as Intellectuals. Toward a Critical Pedagogy of Learning.* Granby, Massachusetts: Bergin and Garvey, 1988.

Goodlad, John I. *A Place Called School: Prospects for the Future.* Boston: McGraw-Hill, 1984.

Hansen, Jane. "First grade writers who pursue reading." In Patricia Stock (Ed.), *Forum. Essays on Theory and Practice in the Teaching of Writing.* Portsmouth, New Hampshire: Boynton/Cook, 1983.

Harste, Jerome; Burke, Carolyn; and Woodward, Virginia. *Language Stories and Literacy Lessons.* Portsmouth, New Hampshire: Heinemann, 1984.

Harste, Jerome; Short, Kathy; and Burke, Carolyn. *Creating Classrooms for Learners: The Reading-Writing Connection.* Portsmouth, New Hampshire: Heinemann, 1988.

Herber, Harold L. *Teaching Reading in Content Areas.* Englewood Cliffs, New Jersey: Prentice-Hall, 1978.

Herr, Michael. *Dispatches.* New York: Knopf, 1977.

Huestis, David. "Revisions as artifacts of beliefs about writing." Unpublished masters thesis, Mount Saint Vincent University, 1987.

Karlin, Robert. *Teaching Reading in High School.* (4th ed.) New York: Harper and Row, 1984.

Mishler, Elliot. "Meaning in context: Is there any other kind?" *Harvard Educational Review, 49* (1), 1979, pp. 1-19.

National Commission on Excellence in Education. *A Nation at Risk: The Imperative for Education.* Washington, D.C.: U.S. Department of Education, 1983.

Neilsen, Allan. "Examining the forces against change: Fulfilling the promise of professional development," unpublished manuscript, 1989.

Neilsen, Allan. "Knowing by doing: An active approach to writing inservice," *Journal of Reading, 29* (8), 1986, pp. 724-728.

Neilsen, Lorri. "A Teacher's Joy: The schooling of a writer." Paper presented at the Fourth International Conference on the Teaching of English, 1986.

Neilsen, Lorri. *Literacy and Living.* Portsmouth, New Hampshire: Heinemann, *in press.*

Pirsig, Robert M. *Zen and the Art of Motorcycle Maintenance: An Inquiry into Values.* Toronto: Bantam Books, 1974.

Proctor, John. "The effects of teachers' theoretical orientations on the writing produced by grade one students." Unpublished masters thesis, University of Alberta, 1986.

Rhodes, Lynn. "The interaction of beginning readers' strategies and texts reflecting alternate models of predictability." Unpublished doctoral dissertation, Indiana University, 1979.

Rosenblatt, Louise M. *The Reader, the Text, the Poem.* Carbondale, Illinois: Southern Illinois University Press, 1978.

Rosenblatt, Louise M. "Viewpoints: Transaction versus interaction – a terminological rescue operation," *Research in the Teaching of English, 19* (1), 1985, pp. 96-107.

Rowe, Deborah W. "Literacy: What messages are we sending?" In Jerome Harste and Diane Stephens (Eds.), *Toward Practical Theory: A State-of-Practice Assessment of Reading Comprehension Instruction.* (Final Report USDE-C-300-83-0130, vol. 2). Bloomington, Indiana: Indiana University, Language Education Department, 1985.

Russell, David H. *Children Learn to Read.* Boston: Ginn, 1961.

Saint Exupery, Antoine de. *The Little Prince*. Translated from French by Katherine Woods. New York: Harcourt Brace Jovanovich, 1971.

Searle, Dennis. "Scaffolding: Who's building whose building?" *Language Arts, 61* (5), 1984, pp. 480-483.

Short, Kathy. "A New Lens for Reading Comprehension: Comprehension processes as critical thinking." In Avon Crismore (Ed.), *Landscapes: A State-of-the-Art Assessment of Reading Comprehension Research*. (Final Report USDE-C-300-83-0130, vol. 1). Bloomington, Indiana: Language Education Department, 1985.

Siegel, Harvey. *Educating Reason: Rationality, Critical Thinking and Education*. New York: Routledge, 1988.

Siegel, Marjorie. "Reading as signification." Unpublished doctoral dissertation, Indiana University, Bloomington, 1983.

Siegel, Marjorie, and Carey, Robert F. *Critical Thinking: A Semiotic Perspective*. Monographs on Teaching Critical Thinking, number 1, Bloomington, Indiana: ERIC Clearinghouse on Reading and Communication Skills and the National Council of Teachers of English, Urbana, Illinois, 1989.

Sizer, Theodore R. *Horace's Compromise: The Dilemma of the American High School*. Boston: Houghton Mifflin, 1984.

Smith, Frank. "Demonstrations, engagement, and sensitivity." In Frank Smith (Ed.), *Essays into Literacy*. Portsmouth, New Hampshire: Heinemann, 1983 (c).

Smith, Frank. *Insult to Intelligence*. Portsmouth, New Hampshire. Heinemann, 1986.

Smith, Frank. "A metaphor for literacy: Creating worlds or shunting information?" In Frank Smith (Ed.), *Essays into Literacy*. Portsmouth, New Hampshire: Heinemann, 1983 (b).

Smith, Frank. "The politics of ignorance." In Frank Smith (Ed.), *Essays into Literacy*. Portsmouth, New Hampshire: Heinemann, 1983 (a).

Smith, Frank. *Reading Without Nonsense*. (2nd ed.) New York: Teacher's College Press, 1985.

Smith, Sharon; Carey, Robert F.; and Harste, Jerome. "The contexts of reading." In A. Berger and H. A. Robinson (Eds.) *Secondary School Reading: What Research Reveals for Classroom Practice*. Urbana, Illinois: National Conference on Research in English, 1982.

ERIC

Spache, Ceorge D., and Spache, Evelyn B. *Reading in the Elementary School.* Boston: Allyn and Bacon, 1969.

Steinbeck, John. *The Log from the Sea of Cortez.* Markham, Ontario: Penguin Books, 1941/1979.

Stephens, Diane, and Clyde, Jean Anne. "Curriculum as theory driven: Insights from six classrooms." In Jerome Harste and Diane Stephens (Eds.), *Toward Practical Theory: A State-of-Practice Assessment of Reading Comprehension Instruction.* (Final Report USDE-C-300-83-0130, vol. 2) Bloomington, Indiana: Language Education Department, 1985. pp. 2:1-41.

Sternberg, Robert J. "Teaching Critical Thinking, Part 1: Are we making critical mistakes?" *Phi Delta Kappan, 67* (3), 1985, pp. 194-198.

Thorndike, Edward L. "Reading as reasoning: A study of mistakes in paragraph reading," *Journal of Educational Psychology, 8*, 1917, pp. 323-332.

Tierney, Robert J., and Lazansky, Jill. "The rights and responsibilities of readers and writers: A contractual agreement," *Language Arts, 57* (6), 1980, pp. 606-613.

Vygotsky, Lev S. *Thought and Language.* Cambridge, Massachusetts: MIT Press, 1962.

Vygotsky, Lev S. *Mind in Society.* Cambridge, Massachusetts: Harvard University Press, 1978.

Weaver, Constance. "Parallels between new paradigms in science and reading and literary theories: An essay review." *Research in the Teaching of English, 19* (3), 1985, pp. 298-316.

John Dewey at his retreat on Sawlor Lake, Hubbards, Nova Scotia. Photos used with permission from Special Collections, Morris Library, Southern Illinois University at Carbondale.

Related Sources in the ERIC Database

This annotated bibliography was selected from searches of the ERIC database and was designed and edited by the staff of the Clearinghouse on Reading and Communication Skills.

Rationale for the transactional perspective

Barnes, Douglas. "Language strategies in learning," *English in Education*, 5 (2) 1971, pp. 31-35. [EJ 046 689]

The author examines the trend of individual student work which is dependent on work-sheet learning. He claims that unless this type of teaching is supplemented with discussion on the part of the student, language communication skills will be hindered.

Christenbury, Leila. "Reactivating the learning process: A short history, a brief rationale." Paper presented at the 77th Annual Meeting of the National Council of Teachers of English, 1987. 12 pp. [ED 291 092]

In most public schools today, where teachers must function as dispensers of knowledge and judges of correctness and students as listeners, repeaters, and memorizers, the learning process is passive. The Progressive Movement, begun by John Dewey, involved students in their education, preparing them not just for college—which many would never attend—but also for life.

Dewey, John. "Mediocrity and individuality," *Educational Forum*, 50 (3), Spring 1986, pp. 357-362. [EJ 332 611]

The author states that our economic and political environment leads us to think in terms of classes, aggregates, and submerged membership in them. He says that it is not just the quantity of our education that is at fault; it is its quality, its spirit, method, and aim.

Dollar, Bruce. "What is really going on in schools," *Social Policy*, 14 (2), Fall 1983, pp. 7-19. [EJ 294 258]

Argues that recent studies on education have failed to recognize the dysfunctional structure of schools. Outlines change strategies suggested by Goodlad and Sizer, who advocate greater clarity of goals, more teacher autonomy, smaller schools or subunits within schools, an end to ability tracking, building-level improvement planning, and student-initiated learning.

Easton, Stanley E. "Social studies in rural schools: A review of the literature," *Small School Forum*, 6 (1), Fall 1984, pp. 8-11. [EJ 308 940]

Analysis of studies indicates textbooks and teaching methods in rural social studies programs, like those in nonrural programs, stress information rather than critical thinking and inquiry skills, and are not relevant to students' lives.

Giroux, Henry A.. and McLaren, Peter. "Teacher education and the politics of engagement: The case for democratic schooling,"

Harvard Educational Review, 56 (3), August 1986, pp. 213-238. [EJ 342 118]

The authors argue that many of the recently recommended public-school reforms either sidestep or abandon the principles underlying education for a democratic citizenry developed by John Dewey and others. The authors outline a teacher education curriculum that links the critical study of power, language, culture, and history to the practice of a critical pedagogy.

Goodlad, John I. "Improving elementary and secondary education in the 1980s." In Subcommittee on Elementary, Secondary, and Vocational Education, "Needs of elementary and secondary education in the 1980s: A compendium of policy papers," 1980. 15 pp. [ED 194 485]

Schools need to be improved holistically, becoming vigorous community institutions. The range of activities used by teachers to motivate, involve, and stimulate students is limited at all levels of schooling.

Goodlad, John I. "What we don't know about schooling," *Phi Delta Kappan, 61* (9) May 1980, pp. 591-592. [EJ 221 579]

The education one gets in school probably is far more dependent on the activities provided there than on the goals schools are asked to achieve.

Harste, Jerome C., *et al.* "Examining our assumptions: A transactional view of literacy and learning," *Research in the Teaching of English, 18* (1) February 1984, pp. 84-108. [EJ 294 749]

Challenges existing assumptions about literacy and literacy learning in an effort to both demonstrate and explore the transactive potentials.

Metzger, Devon J. "Coming to terms with citizenship education," *Louisiana Social Studies Journal, 13* (1), Fall 1986, pp. 11-14. [EJ 338 269]

Criticizes current citizenship education that often results in antidemocratic attitudes due to obvious conflicts between the classroom and society and a rigid socialization process discouraging critical examination, questioning, and participation by youth. Encourages an approach whereby students can effectively participate and feel confident they can make a difference in society.

Searle, Dennis. "Scaffolding: Who's building whose building?" *Language Arts, 61* (5), September 1984, pp. 480-483. [EJ 304 042]

Discusses how the concept of "scaffolding," adult support of children's attempts to achieve an intended language outcome, has been somewhat misused in the schools, resulting in the support of the teacher's intentions rather than those of the child.

Siegel, Harvey. "Critical thinking as an educational ideal," *Educational Forum, 45* (1), November 1980, pp. 7-23. [EJ 238 050]

Defining critical thinking and discussing its relevance to the ethics and epistemology of education, the author presents three reasons why it is an educational ideal. 1) it forms the basis of a moral process of teaching; 2) it prepares students to manage their adult lives; and 3) it initiates students into rational traditions.

Sizer, Theodore R. "Landmarks in the literature: The schools and the Orwellian possibility," *New York University Education Quarterly, 9* (3), 1978, pp. 29-32. [EJ 184 344]

Detects a disturbing trend toward the control of teenagers' lives in rereading the 1893 "Report of the Committee of Ten on Secondary School Studies," Harry Rivlin's 1936 "Education for Adjustment", and the 1974 study, "Youth: Transition to adulthood."

Smith, Frederick R., and Feathers, Karen M. "The role of reading in content classrooms: Assumption vs. reality," *Journal of Reading, 27* (3), December 1983, pp. 262-267. [EJ 291 333]

Reports on a study of the role of reading in two middle school and two high school content area classrooms. Concludes that for students in all four classes, reading was neither meaningful nor necessary, with the main purpose of reading being to locate answers to literal questions.

Sternberg, Robert J. "Teaching critical thinking, Part 1: Are we making critical mistakes?" *Phi Delta Kappan, 67* (3), November 1985, pp. 194-198. [EJ 327 970]

The first part of a two-part article describes the significant differences between the kinds of problems that adults really face and the problems that students are taught to resolve in critical thinking programs.

Vandervoort, Frances S. "What would John Dewey say about science teaching today?" *American Biology Teacher, 45* (1) January 1983, pp. 38-41. [EJ 277 110]

Focuses on Dewey's ideas about science teaching, including inquiry, education involving progressive organization of knowledge by experience, and citizenship education. Indicates that today's science teaching is often inadequate and inappropriate, not focusing on inquiry and neglecting science/society issues and science career awareness.

Watchke, Gary. "Blueprints for educational reform," Informational Bulletin 83-IB-1. Madison, Wisconsin: Wisconsin State Legislative Reference Bureau, 1983. 36pp. [ED 252 516]

Summaries are presented of recent study reports on the current status of education in the United States: 1) "A Nation at Risk" (National Commission on Excellence in Education); 2) "Action for Excellence" (Education Commission of the States); 3) Precollege Education in Mathematics, Science and Technology); 4) "High School: A Report on Secondary Education in America" (Carnegie Foundation for Advancement of Teaching), 5) "Making the Grade" (Twentieth Century Fund Task Force on Federal and Elementary and Secondary Education Policy); 6) "A Place Called School: Prospects for the Future" (John Goodlad); and 7) "The Troubled Crusade" (Diane Ravitch).

Wiggins, Sam P. "A view of a place called school," *Educational Leadership, 40* (7), April 1983, pp. 35-37. [EJ 279 517]

Describes the national study of the characteristics of schools undertaken in John Goodlad's "A Study of Schooling" and why it is a landmark in American education.

Theoretical, philosophical background

Adams, Albert, and Reynolds, Sherrod. "The long conversation: Tracing the roots of the past," *Journal of Experiential Education*, 4 (1), Spring 1981, pp. 21-28. [EJ 247 662]

Provides an historical overview of the progressive education movement, noting its major philosophical threads.

Avery, Robin D. "Democracy in American education: Research implications," Paper presented at the 7th Annual Meeting of the Michigan Educational Research Association, 1980. 11 pp. [ED 184 932]

The works of John Dewey and John Childs are reviewed with reference to the implications for research inherent in society's moral choice to provide a democratic education for its children.

Baron, Jonathan. "Reflective thinking as a a goal of education," *Intelligence*, 5 (4), October-December 1981, pp. 291-309. [EJ 260 805]

Dewey's notion of "reflective thinking" is discussed. A model of phases of reflective thinking is described. problem recognition, enumeration of possibilities, reasoning, revision, and evaluation.

Bernstein, Richard J. "The varieties of pluralism," *American Journal of Education*, 95 (4), August 1987, pp. 509-525. [EJ 360 197]

Discusses current relevance of ideas of pragmatic thinkers and John Dewey. The pragmatic understanding of pluralism displays a sensitivity to difference but also emphasizes reaching out and communicating with what is different from ourselves. Without that, pluralism becomes chaos.

Berthoff, Ann E. "Tolstoy, Vygotsky, and the making of meaning," *College Composition and Communication*, 29 (3), October 1978, pp. 249-255. [EJ 190 240]

Leo Tolstoy and Lev Vygotsky, like Sylvia Ashton-Warner, Maria Montessori, and Paulo Freire, base their educational philosophies on the heuristic power of language, the form-finding and form-creating powers of the mind.

Boisvert, Raymond D. "John Dewey's reconstruction of philosophy," *Educational Studies: A Journal in the Foundations of Education*, 16 (4), Winter 1985, pp. 343-353. [EJ 332 242]

Discusses the general philosophy of Dewey and specific applications of his philosophy, especially to questions of democracy and education.

Bruner, Jerome. "Models of the learner," *Educational Researcher*, 14 (6), June-July 1985, pp. 5-8. [EJ 320 590]

The state of education cannot be improved without a model of the learner that is not fixed but varies. A choice of one reflects many political, practical, and cultural issues, but the best choice may be an awareness of the possible variety.

Bruner, Jerome S. "Education as social intervention," *Journal of Social Issues, 39* (4), 1983, pp. 129-141. [EJ 296 266]

In this 1964 paper, Bruner argued for a redefinition of the nature, direction, and aims of education because of increased understanding of man as a species and of individual mental growth, clearer understanding of the educational process, and the changing nature of society.

Bruner, Jerome S., and Olson, David R. "Symbols and texts as tools of intellect," *Interchange, 8* (4), 1978, p. 115. [EJ 187 806]

The impact of language (especially written language) on the acquisition of knowledge and skills in children is discussed.

Bruss, Neal, and Macedo, Donaldo P. "Toward a pedagogy of the question: Conversations with Paulo Freire," *Journal of Education, 167* (2), 1985, pp. 7-21. [EJ 321 072]

Excerpts from two talks by Paulo Freire in February 1985 reiterate the need to develop a theoretical framework from which an empowering, humanistic pedagogical structure can be built. They proposed a pedagogy that forces learners to think critically and adopt a critical attitude toward the world.

Bullock, Chris. "Using theory in the classroom: Vygotsky and the teaching of composition," *English Quarterly, 16* (2), Summer 1983, pp. 14-20. [EJ 286 548]

Explores the implications of Soviet psychologist Lev Vygotsky's cognitive theories on the writing process.

Callan, Eamonn. "Dewey's conception of education as growth," *Educational Theory*, 32 (1) Winter 1982, pp. 19-27. [EJ 278 831]

John Dewey's doctrine that education is a process of continuing growth is analyzed and critiqued.

Carlson, Kenneth. "An imaginary interview with George S. Counts," *Social Education, 49* (8), November-December 1985, pp. 689-690. [EJ 325 858]

George S. Counts promoted the progessive education ideas developed by John Dewey. A faculty member at Teachers College, Columbia University, from 1927 to 1956, Counts stressed the importance of pragmatism in education. The author, an admirer of Counts, created dialogue that he and Counts might have had if Counts were alive today.

Colwell, Tom. "The ecological perspective in John Dewey's philosophy of education," *Educational Theory, 35* (3), Summer 1985, pp. 255-266. [EJ 326 401]

Offers an interpretation of John Dewey's educational thoughts from an ecological point of view, i.e., one which sees educational activity as an interrelationship between human organisms and social environment and the nonhuman biophysical environment.

Dewey, John. "Experience and education," *Educational Forum, 50* (3), Spring 1986, pp. 241-252. [EJ 332 588]

Indicates some of the main problems that Dewey sees with which the newer education is confronted and suggests the main lines along which their solution is to be

sought. He discusses the principle of the continuity of experience or what may be called the experiential continuum.

De Lisi, Richard. "Landmarks in the literature: Children's thought and language," *New York University Education Quarterly, 13* (1), Fall 1981, pp. 29-31. [EJ 253 179]

Compares the theories of Piaget and Vygotsky on the relationships between child language and thought, as presented in their respective works, "The Language and Thought of the Child" and "Thought and Language."

Ediger, Marlow. "Goodlad versus Popham on effective teaching," *Clearing House, 61* (5), January 1988, pp. 211-214. [EJ 368 595]

Presents the positions of educators John Goodlad, who emphasizes an open-ended curriculum, and James Popham, who believes in structured curriculum development, with an emphasis on behaviorism. Concludes that Popham's view is criticized for emphasizing lower cognitive objectives.

Elias, John L. "Social learning and Paulo Freire," *Journal of Educational Thought, 8* (1), 1974, pp. 5-14. [EJ 095 691]

This article discusses Freire's concept of conscientization or social learning, various levels of consciousness described by Freire, and how this concept compares to the theories of the educational theorist, John Dewey.

Friedman, Sheila. "'The Mozart of psychology': 'Mind in society' by L. S. Vygotsky: Implications for improving literacy," 1985. 16 pp. [ED 277 972]

In "Mind in Society," published more than 50 years ago in Russia, Vygotsky views children as active participants in their own learning and suggests that research analyze processes, reveal causes, reconstruct points of development, and study responses to teaching.

Giroux, Henry A. "Critical literacy and student experience: Donald Graves' approach to literacy," *Language Arts, 64* (2), February 1987, pp. 175-181. [EJ 346 930]

Argues that Donald Graves' approach to critical literacy provides a crucial insight into the learning process by linking the nature of learning with the dreams, experiences, histories, and languages that students bring to school.

Harste, Jerome C., and Burke, Carolyn L. "Toward a socio-psycholinguistic model of reading comprehension," *Viewpoints in Teaching and Learning, 54* (3), July 1978, pp. 9-34. [EJ 193 359]

This paper documents the personal reality of models of reading by examining both their function and reality, clarifies the current status of reading comprehension via an exploration into its conceptual base, and sketches and explores some of the ramifications of a socio-psycholinguistic model of reading.

MacDonald, Kevin. "Developmental models and early experience," *International Journal of Behavioral Development, 9* (2), June 1986, pp. 175-190. [EJ 341 724]

Attempts to describe links between transactional or dialectical and mechanistic models of development and provides a rationale for both.

McDermott, John J. "America: The loneliness of the quest," *Teachers College Record, 85* (2), Winter 1983, pp. 275-290. [EJ 296 043]

This article discusses the development of the "individual" in America from John Dewey's and Josiah Royce's philosophical perspectives.

Miller, John P. "Atomism, pragmatism, holism," *Journal of Curriculum and Supervision 1* (3), Spring 1986, pp. 175-196. [EJ 335 722]

Examines three world views influencing curriculum development—atomism (underpinning competency-based education), pragmatism (promoting inquiry-based approaches), and holism (associated with confluent or Waldorf education). Holism embodies the perennial philosophy and attempts to integrate cognitive, affective, and transpersonal dimensions, avoiding the fragmentation and value-neutrality of other approaches.

Raywid, Mary Anne. "The discovery and rejection of indoctrination," *Educational Theory, 30* (1), Winter 1980, pp. 1-10. [EJ 239 528]

Instruction in democracy is not primarily a matter of arbitrarily imposing our society's ways on immature individuals. For Dewey, the interests of a democratic society lie in maximizing the potential of the individuals constituting it. Both the social system and the educational process are responsible for contributing to individual development.

Rosenblatt, Louise M. *The Reader, the Text, the Poem: The Transactional Theory of the Literary Work.* Carbondale, Illinois: Southern Illinois University Press, 1978. [ED 165 145; not available from EDRS]

Transactional literary theory centers on the reader's contribution in the two-way relationship with the literary text, lifting the reader to a prominent, essential position along with the author of the text. It develops the premise that the reader evokes a literary work through selective attention to details of the author's "paper and ink." The result that transactional literary theory intends is not so much to understand the completeness of a book as to understand the completeness of the reader.

Rosenblatt, Louise M. "The transactional theory of the literary work: Implications for research." Paper presented at the Buffalo Conference on Researching Response to Literature and the Teaching of Literature, 1977. 33 pp. [ED 209 667]

Keeping the reader's active process of evocation of the literary work central will have important implications for questions raised and methods used in both teaching and research. As for teaching, research should focus on the transactional model, with its emphasis on the total situation in which the relationship with the text occurs. Moreover researchers must realize that the community, the ethos of the schools, the total curriculum, and the cumulative emphases of the literary texts presented are settings for any encounter between a reader and a text in a classroom.

Rosenblatt, Louise M. "Viewpoints: Transaction versus interaction—a terminological rescue operation," *Research in the Teaching of English, 19* (1), February 1985, pp. 96-107. [EJ 309 867]

The transactional theory of reading is disassociated from information processing and interactive processing, and the implications for research of various concepts basic to the total transactional theory of reading are discussed.

Ross, E. Wayne, and Hannay, Lynne M. "Reconsidering reflective inquiry: The role of critical theory in the teaching of social studies," *Southern Social Studies Quarterly*, 13 (2), Fall 1987, pp. 2-19. [EJ 371 111]

Maintains that most current descriptions of reflective inquiry portray Dewey's model incorrectly as a series of individual steps to be mastered in a procedural fashion. Offers an alternative approach to reflective inquiry.

Rud, Anthony G., Jr. "Critical thinking and pre-college philosophy." Paper presented at the 67th American Educational Research Association Annual Meeting, 1986. [EJ 272 415]

Robert Ennis, John McPeck, Harvey Siegel, and Matthew Lipman are considered to support the conclusion that though critical thinking is a necessary condition of philosophical thinking, it is not a sufficient condition. Philosophical thinking as taught in the pre-college curriculum is characterized as the interplay of dialogue and reflection growing out of an initial sense of wonder.

Siegel, Harvey. "Critical thinking as an intellectual right," *New Directions for Child Development*, No. 33, Fall 1986, pp. 39-49. [EJ 346 022]

Provides a philosophical defense of the view that children have an ethical right to an education that helps them become critical thinkers. Argues for a child's right not to be indoctrinated by anyone and points out an important distinction between morally repugnant indoctrination and nonindoctrinative inculcation of beliefs and attidutes.

Siegel, Marjorie. "Transactional theory as a potential for research in literacy." Paper presented at the 29th Annual Meeting of the International Reading Association, 1984. 12 pp. [ED 247 541]

A transactional investigation of reading considers comprehension to be more than the duplication of the author's message. Rather, it entails the readers' interpretation of the textual representation that he or she has constructed. Thus, researchers must ask how the reader duplicated the author's creative role.

Ulvund, Stein Erik. "Early experience and the development of cognitive competence: Some theoretical and methodological issues," *Scandinavian Journal of Educational Research*, 26 (2), 1982, pp. 45-75. [EJ 268 807]

Argues that in analyzing effects of early experience on development of cognitive competence, theoretical analyses as well as empirical investigations should be based on a transactional model of development.

VanDickle, Ron[illegible] L. "Research implications of a theoretical analysis of John Dewey's 'How We Think,'" *Theory and Research in Social Education*, 13 (3), Fall 1985, pp. 1-20. [EJ 32[illegible]0]

John Dewey's theory of reflective thought as presented in "How We Think" (1983) is analyzed. Components and relationships in the processes of reflective thought and teaching people to think effectively are identified.

Weaver, Constance. "Parallels between new paradigms in science and in reading and literary theories: An essay review," *Research in the Teaching of English, 19* (3), October 1985, pp. 298-316. [EJ 323 366]

Explores parallels between new paradigms in the sciences, particularly quantum physics, chemistry, and biology, and new paradigms in reading and literary theory, particularly a socio-psycholinguistic, semiotic, transactional view of reading, and a transactional view of the literary experience.

Weaver, Constance. "Reading as a whole," Paper presented at the 77th Annual Meeting of the National Council of Teachers of English, 1987. 16 pp. [ED 290 132]

Recent research by Frank Smith, Kenneth Goodman (1973), and others indicates reading is a process of constructing meaning rather than merely obtaining meaning. Similarly, Jean Piaget and cognitive psychologists like Lev Vygotsky have advanced the concept that children learn best when what is to be learned is functional and concrete rather than dysfunctional and abstract, indicating that learning to read should be approached as a whole-part-whole language process which replaces dull and often frustrating drills with opportunities to develop an understanding of and pleasure in the written word.

Wilson, Lionel. "The reader's contribution in the literary experience: Interview with Louise Rosenblatt," *English Quarterly, 14* (1), Spring 1981, pp. 3-12. [EJ 250 970]

This interview discusses Dr. Rosenblatt's books in literature and reading and explores the transactional theory of reading in which the text and the reader are equally important.

The teacher in the transactional classroom

Barnes, Douglas. *The Learner and the School*, Penguin Papers in Education. Champaign, Illinois:National Council of Teachers of English, 1969. [ED 030 643; not available from EDRS.]

Discusses the student-teacher language interaction in 12 sample lessons, and analyzes the importance upon student learning of the languages used by the classroom teacher.

Braun, Carl, *et al.* "Teacher's expectations: Prime mover or inhibitor?" *Elementary School Journal, 76* (3), 1975, pp. 181-188.

Explores effects of teacher expectations on children's motivation to learn.

Buckley, Rosemary. "A funny thing happened on the way to 'reading readiness': A teacher learns from the learners," *Language Arts, 64* (7), November 1987, pp. 743-746. [EJ 360 699]

Describes a teacher's metamorphosis from a controlling kindergarten teacher to one who recognized that children already have a great deal of language and print awareness and

who could assist them in self-directed learning by giving their language instruction a context.

Giroux, Henry A. "Critical pedagogy, cultural politics, and the discourse of experience," *Journal of Education, 167* (2), pp. 22-41. [EJ 326 073]

Analyzes how traditional and liberal discourses treat the intersection of culture, power, and knowledge in fashioning a view of teaching and learning. Argues that it is necessary to develop a critical discourse that embraces pedagogy as a form of cultural politics.

Goodman, Jesse. "The socialization of potentially empowered preservice teachers: A case study and theoretical analysis." Paper presented at the Bergamo Curriculum Theory and Practice Conference, 1986. 43pp. [ED 274 655]

"Empowered" teachers carefully consider the content of what is taught to children, are active in developing original curriculum based upon their own and/or their pupils' interests, and are able to creatively use materials, personal talents, and innovative resources in learning activities.

Harste, Jerome C., *et al.* "The teacher of reading." Paper presented at the 21st Annual Meeting of the International Reading Association, 1976. 43pp. [ED 123 552]

Suggests a model of teacher as decision-maker and attempts to relate dominant teacher beliefs and characteristics with their theoretical orientation toward reading instruction.

Harste, Jerome C. "Understanding the hypothesis: It's the teacher that makes the difference, Part II," *Reading Horizons, 18* (2), 1978, pp. 89-98. [EJ 173 463]

Suggests that both the teaching and learning of reading are theoretically based and that it is more productive to look at reading instruction in terms of theoretical orientation than in terms of reading approaches.

Kohl, Herbert. "Who are these educational 'Experts'...and what are they really up to?" *Learning, 12* (6), January 1984, pp. 26-29. [EJ 292 455]

This commentary on educational reform proposals from the 1950s to the present argues that psychologists and other academicians cannot change the schools, they can only make suggestions. Teachers must become the leaders in making the schools decent, creative, enriching places for children to learn.

Kurfiss, Joanne. "Teaching teachers about teaching thinking; Toward a transactional instructional approach." Paper presented at the Annual Meeting of the Northern Rocky Mountain Educational Research Association, 1985. 22 pp. [ED 271 425]

A description is given of an inservice course designed to acquaint teachers with current constructivist thinking and research in cognitive and developmental psychology.

The focus was on sensitizing the teachers to the challenges of creating a "thinking environment" in their classrooms.

Palincsar, Annemarie Sullivan, and Brown, Ann L. "Interactive teaching to promote independent learning from text," *Reading Teacher*, 39 (8), April 1986, pp. 771-777. [EJ 332 836]

Describes the uses and benefits of reciprocal teaching, a strategy that promotes both comprehension of text and comprehension monitoring.

Proefriedt, William A. "The significance of the teacher's work," *Educational Theory*, 31 (3-4), Summer-Fall 1981, pp. 341-349. [EJ 278 763]

Arguments that the schools serve a conservative function, passing on existing social values, are summarized and critiqued. Teachers can plan a role in social change by: 1) teaching students to reflect critically on their own values; 2) helping them realize that individuals can change things; and 3) presenting moral education about social issues.

Reinhartz, Judy, (Ed.) *Perspective on Effective Teaching and the Cooperative Classroom*, Analysis and Action Series. Washington, D.C.: National Education Association, 1984. [ED 250 279; not available from EDRS.]

This collection of seven articles includes discussions by Georgea M. Sparks, John I. Goodlad, Elliot W. Eisner, Philip L. Hosford, Robert Garmston and Arthur Costa, Ralph W. Tyler, and Chick Moorman, Dee Dishon, and Pat Wilson O'Leary.

Smith, Frank. *Reading Without Nonsense*, (2nd ed). New York: Teachers College Press, Columbia University, 1985 (1st ed; 1979 – ED 178 870). [ED 255 899; not available from EDRS.]

The premise of the analysis is that only through reading do children learn to read, thus the function of a teacher is to act as a guide and choose materials and methods that will make reading easy for learners.

Tierney, Robert J., and Rogers, Theresa. "Functional literacy in school settings," *Theory into Practice*, 25, Spring 1986, pp. 124-127. [EJ 336 845]

Rather than prescribe activities, teachers should approach the development of literacy programs from a functional point of view, allowing students to achieve purposes relevant to their situation.

Watson, Jerry L. "A positive environment promotes speaking, thinking, feeling," 1976. 13pp. [ED 158 319]

Teachers of young children affect not only their ability to speak correctly but also the way they learn to think. The teacher can participate in the child's development by raising appropriate questions and entering into dialogue with the student.

Approaches recommended by the theory

Barell, John, *et al.* "Fostering thoughtful self-direction in students," *Educational Leadership*, 45 (7), April 1988, pp. 14-17. [EJ 370 282]

Programs to teach students critical thinking must empower them to be self-directed, but must also stress respect and empathy for viewpoints of others.

Best, David. "Primary and secondary qualities: Waiting for an educational Godot," *Oxford Review of Education*, *11* (1), 1985, pp. 73-84. [EJ 319 053]

While there is a place in education for factual knowledge and useful skills, they should be recognized as of secondary value. The primary qualities that should be taught are the development of 1) moral values and attitudes and 2) critical independent thinking in a spirit of creative inquiry.

Bollenbach, Carolyn. "Comprehension," *Journal of Creative Behavior*, *20* (2), 1986, pp. 89-92. [EJ 347 205]

Teaching comprehension skills requires teaching to intuition with activities such as presenting puzzling situations to introduce a topic, using art to elicit latent feelings, using imagery and improvisations to enhance visualization, and using music and dance to encourage nonverbal expressions.

Boyer, Ernest L. "Toward school-college collaboration," *Thought & Action*, 3 (2), Fall 1987, pp. 7-18. [EJ 363 728]

American higher education should have three priorities. 1) show students that we are connected through the use of symbols, 2) help students understand, through science, the underlying patterns and connections of the natural world, and 3) teach students about social and civic institutions through familiarity with other cultures.

Bozik, Mary. "Critical thinking through creative thinking." Paper presented at the 73rd Annual Meeting of the Speech Communication Association, 1987. 13pp. [ED 290 173]

It was once thought that creativity is something that some are born with and some are not, but recent research has found that creativity can be fostered like any other thinking skill Findings have revealed that mastering any kind of knowledge requires both creativity and critical skills, while early stages of learning require simple memorization of rules.

Brown, Ann L., and Palincsar, Annemarie S. "Guided, cooperative learning and individual knowledge acquisition," Technical Report No. 372. Cambridge, Massachusetts: Bolt, Beranek and Newman, and the Center for the Study of Reading, Urbana, Illinois, 1986. 116pp. [ED 270 738]

Drawing upon Piagetian and Vygotskian developmental theories, philosophical examinations of the nature of argument and explanation, analyses of classroom and Socratic dialogues, and cooperative classroom structures, this paper examines how cooperative learning can influence individual knowledge acquisition. The paper first reviews some of the theoretical claims concerning a variety of group learning procedures and the evidence that supports their efficacy. 1) group participation aids learning, 2) group settings force learning with understanding and thus produce conceptual changes, and 3) individual thought processes originate in social interaction. The paper then examines a program of guided cooperative learning – reciprocal teaching, which combines expert scaffolding, guided practice in applying simple concrete strategies, and cooperative learning discussions.

Chew, Charles R. "Whole language: Not the sum of its parts." Paper presented at the Meeting of the Catskill Whole Language Conference, 1987. 16pp. [ED 286 181]

Teachers need 1) to recognize that children come to the classroom knowing something about language use, and that their prior knowledge must be built up and used to help them comprehend and use language experiences and 2) to understand that the integration of language arts skills can empower students and build their confidence, and thus improve children and society as a whole.

Christenbury, Leila, and Kelly, Patricia P. *Questioning: A Path to Critical Thinking*. Urbana, Illinois· ERIC Clearinghouse on Reading and Communication Skills, 1983. 40pp. [ED 226 372]

Intended to help upper elementary and secondary school teachers increase their students' critical thinking, this booklet discusses the theory and techniques behind the use of questioning to evoke prior knowledge and inquiry.

Crismore, Avon. "The roles of interpretive communities for reading and writing at Atkinson Academy." Paper presented at the 33rd Annual Meeting of the National Reading Conference, 1983. 18pp. [ED 252 841]

Meaning does not reside in the text or the reader but results from interactions between text, reader, and the interpretive communities that the readers belong to or that influence them. For a child, the interpretive communities consist of the intrapersonal, or the child's relationship between the self as reader and the self as writer as authorities and influences during interpretation. It also consists of the interpersonal, or the child's relationship with teachers, peers, family, and others as authorities and influences.

DeFord, Diane, and Harste, Jerome C. "Child language research and curriculum," *Language Arts, 59* (6), September 1982, pp. 590-600. [EJ 267 031]

Examines notions and examples of instruction that can inhibit language growth, arguing that reading and writing curricula can be designed so that children are provided the freedom to explore language and grow as language learners in much the same way they learned oral language.

Doll, William E., Jr. "A methodology of experience: Part II, The process of inquiry." Paper presented at the American Educational Research Association Meeting, 1973. 29pp. [ED 079 622]

This report emphasizes the following curricular principles; 1) the field of study should be explored from the viewpoint of its practical problems and operations, 2) the students' own habits of inquiry and decision-making should be explored, developed, and transformed; 3) students should be given areas in which they can exercise power, responsibility, and choice, and 4) the curriculum pattern should encourage pluralism and alternatives.

Frederick, Peter J. "Student involvement: Active learning in large classes," *New Directions for Teaching and Learning, 32*, Winter 1987, pp. 45-56. [EJ 363 696]

Suggestions to help faculty discover ways of ach...ing interactive, investigatory, and intimate learning environments are provided to empower students to take responsibility for their own learning.

Gehlbach, Roger D. "Children's play and self-education," *Curriculum Inquiry, 16* (2), Summer 1986, pp. 203-213. [EJ 337 461]

Because both child and adult perceive to have learned "on their own," play as a form of "curriculum" may serve as an important simulation for later, self-directed learning.

Guyton, Edith M. "An analysis of the cognitive antecedents of political variables." Paper presented at the 68th Annual Meeting of the American Educational Research Association, 1984. 24pp. [ED 245 951]

A conceptual model was developed and assessed to examine the relationship between critical thinking and political participation.

Holbrook, Hilary Taylor. "ERIC/RCS: Reader response in the classroom," *Journal of Reading, 30* (6), March 1987, pp. 556-559. [EJ 348 961]

Explores briefly the New Criticism that dominated literature instruction until recently and then provides an overview of reader response theory and how response approaches can be used in the classroom to enhance reading.

Johnson, David W., and Johnson, Roger T. "Having your cake and eating it too: Maximizing achievement and cognitive-social development and socialization through cooperative learning." Paper presented at the 90th Annual Convention of the American Psychological Association, 1982. 17pp. [ED 227 408]

Research on the outcomes of cooperative learning strategies suggests they promote simultaneously high achievement, constructive student-student relationships, positive attitudes toward subject areas, continuing education, critical thinking, cooperative tendencies, and psychological health.

Krabbe, Mark A. "Self-directed learning of the basic skills," *Clearing House, 56* (8), April 1983, pp. 372-373.

Distinguishes self-directed learning from individualized instruction and discusses the role of the teacher in promoting self-directed learning.

Langer, Judith A. "A sociocognitive perspective on literacy," 1986. 39pp. [ED 274 988]

In a sociocognitive perspective of literacy that incorporates social practices, conceptions of reading and writing, and literacy as a way of thinking, literacy is culturally based, involves the higher intellectual skills, and is learned by children as they interact with their families and communities.

Lazerson, Marvin, *et al.* "Learning and citizenship: Aspirations for American education," *Daedalus, 113* (4), Fall 1984, pp. 59-74. [EJ 322 814]

If schools are to enhance a citizenship based on taking responsibility for one's thinking and actions, imaginative expression and critical thinking must be taught.

ERIC

Malmgren, Rene L. "Andre can read," *Phi Delta Kappan, 67* (1), September 1985, pp. 65-66. [EJ 326 614]

Allowing a fifth grader who caused problems in regular classrooms to exert control over some learning activities led to the student's involvement in the activities, his commitment to their completion, and the development of a situation that made learning to read desirable and acceptable to him.

Miller, Susan. "Is there a text in this class?" *Freshman English News, 11* (1), Spring 1982, pp. 20-24. [EJ 268 211]

Elucidates the tenets of reader response criticism that are compatible with the classroom teaching of writing.

Murnion, William E. "Formality and informality in reasoning." Paper presented at the Meeting of the Conference on Critical Thinking, 1987. 18pp. [ED 287 179]

Advocates of critical thinking tend to deny that intuition and justification are logical, even though they assume that both processes are rational. However, it can be demonstrated that the relation between intuition and inference, between justification and explanation, is dialectical and complementary, so that there is no mystery as to 1) how informal reasoning supplies the content of the knowledge articulated in formal reasoning or 2) how formal reasoning explicates the form of the knowledge acquired in informal reasoning.

Palincsar, Annemarie Sullivan, and Brown, Ann L. "Reciprocal teaching of comprehension-monitoring activities," Technical Report No. 269. Cambridge, Massachusetts: Bolt, Beranek and Newman and the Center for the Study of Reading, Urbana, Illinois, 1983. 81pp. [ED 225 135]

Studies tested the effectiveness of reciprocal teaching as a means of instructing seventh-grade poor readers about activities they could use to increase comprehension and to ascertain that their comprehension was proceeding smoothly (comprehension monitoring). Reciprocal teaching involves having the teacher and students take turns leading dialogues about pertinent text features.

Palincsar, Annemarie Sullivan, and Brown, Ann L. "Teaching and practicing thinking skills to promote comprehension in the context of group problem solving," *Remedial and Special Education (RASE), 9* (1), January-February 1988, pp. 53-59. [EJ 367 434]

Listening and reading comprehension are seen as problem-solving activities, which require instruction in thinking skills. An instructional technique, reciprocal teaching, is conducted as a group problem-solving activity to teach remedial and special education students to predict, question, summarize, and clarify while reading and listening to text.

Pearson, P. David, and Dole, Janice A. "Explicit comprehension instruction: A review of research and a new conceptualization of instruction," *Elementary School Journal, 88* (2), November 1987, pp. 151-165. [EJ 362 748]

Reviews representative instructional studies of inference training, reciprocal teaching, and process training. Discusses both the concept of explicit comprehension instruction and potential difficulties in classroom implementation.

Roth, Rita. "Literacy acquisition and knowledge control in the first grade." Paper presented at the Annual Meeting of the American Educational Research Association, 1983. 28pp. [ED 227 451]

Explores the relationship between social/cultural control and the way knowledge is structured and presented in schools.

Rydell, Susan T. "Educational materials development and use with self-directed learners," *New Directions for Continuing Education*, 17, March 1983, pp. 61-67. [EJ 279 005]

Provides an overview of research findings related to self-directed learning and discusses materials for teaching self-directedness and their use with self-directed learners.

Samuelson, Janet. "Empowering the powerless: Authority in the writing classroom." Paper presented at the 37th Annual Meeting of the Conference on College Composition and Communication, 1986. 11pp. [ED 268 541]

The teaching of composition demands a democracy in the classroom that is necessary for students' growth in writing, reading, thinking, and learning.

Smith, Frank. "The promise and threat of microcomputers for language learners." In Handscombe, Jean, *et al* (Eds). *The Question of Control*, Selected Papers from the 17th Annual Convention of Teachers of English to Speakers of Other Languages, 1983. 19pp. [ED 275 138]

Computers must be used carefully, but they offer many possibilities, largely unexplored. Computer capabilities, particularly word processing, provide such options as joint authorship, networking, and long-distance communication and collaboration through cross-cultural letter writing.

Spickler, Theodore R. " Improving reasoning through enhancement of physical intuition." Paper presented at the American Association of Physics Teachers/American Physical Society Winter Meeting, 1985. 11pp. [ED 254 416]

The strength of intuitive knowledge is illustrated by the difficulty that individuals have in trying to restructure student misconceptions. In order to harness this power, intuition must be developed within the context of each new concept to be taught. An experiment with one possible approach to this instructional problem is described and evaluated.

Staton, Jana. "Thinking together: Language interaction in children's reasoning," *The Talking and Writing Series, K-12: Successful Classroom Practices*. Washington, D.C.: Pingle Associates, 1983. 51pp. [ED 233 379]

This booklet examines the language interaction that takes place between student and teacher and between student and student whenever a genuine dialogue about an important event or problem occurs.

Stradling, Bob. "Controversial issues in the curriculum," *Bulletin of Environmental Education,*" 170, July 1985, pp. 9-13. [EJ 332 157]

Reviews the problems and benefits associated with instruction of controversial issues, questioning the effectiveness of a neutral and objective position in the discussion of controversial topics. Also assesses prevalent teacher tendencies in instructional approaches and offers suggestions for classroom adoption.

Thomas, John W., and Strage, Amy. "Improving students' self-directed learning: Issues and guidelines," *Elementary School Journal, 88* (3), January 1988, pp. 313-326. [EJ 366 496]

Defines self-directed learning and explores its importance for elementary education. Focuses on ways in which classroom practices and conditions can encourage or discourage capabilities and dispositions to engage in self-directed learning. Describes the ideal classroom environment.

Treffinger, Donald J., and Barton, Betty L. "Fostering independent learning," *Gifted Child Today (GCT), 11* (1), January-February 1988, pp. 28-30. [EJ 366 141]

Discusses ways to help gifted children learn to competently manage and direct a substantial part of their own learning.

Walsh, Debbie. "Critical thinking to reduce prejudice," *Social Education, 52* (4), April-May 1988, pp. 280-282. [EJ 369 623]

Maintains that students can be taught antiprejudicial thinking by infusing their school experience with critical thinking about knowledge and life. Lists ten attitudes considered essential to the development of critical thinking and reviews classroom characteristics which support prejudice reduction.

Weiner, Linda. "The composition class: Outward bound." Paper presented at the Fall Conference of the College English Association of Ohio, 1984. 14pp. [ED 251 853]

The essential goals of the Outward Bound program—1) self-discovery, 2) the extending of perspectives, 3) the appreciation of choices as critical to comfort, 4) the extending of problem-solving abilities, and 5) a concern for others—were applied in a composition classroom and appeared to have a beneficial effect on the growth of students and the teacher.

Winterowd, W. Ross. "Literacy: 'Kultur' and culture." Paper presented at the 38th Annual Meeting of the Conference on College Composition and Communication, 1987. 11pp. [ED 281 233]

Freire argues that cultural literacy can only be achieved through "problem-posing education," consisting of acts of cognition, not transferrals of information. The students, in dialogue with the teacher, must create their own knowledge, a goal that they cannot reach if they deal only with Kultur. A language arts lesson that uses the "masters" as examples of what might be accomplished and student texts as paradigms of the failure to reach the ideal, will only alienate learners. But the danger in problem-posing education is obvious. all

absolute certainty vanishes, except the faith that new insight, greater understanding lies just beyond the next question.

Woods, Donald R. "How might I teach problem solving?" *New Directions for Teaching and Learning* (Developing Critical Thinking and Problem-Solving Abilities), 30, 1987, pp. 55-71. [EJ 355 731]

The implications of the interaction between knowledge acquisition and problem solving are discussed. Options for the teaching of problem solving are listed including: giving students the opportunity to solve many problems, facilitating students' exploration of the mental processes used to solve problems, and providing explicit training in the component skills.

Some specific applications

Allen, Michael S. "'Fishing' on the 'Wooster Review': A look at a student interpretive community." Paper presented at the 38th Annual Meeting of the Conference on College Composition and Communication, 1987. 17pp. [ED 280 052]

The "Wooster Review," a national literary magazine staffed by undergraduates, began in 1983 as an experiment in student publishing. A naturally formed interpretive community emerged as the "Review" developed: as students read, they noticed weaknesses or thought of other options the writer could have chosen; as they discussed, they began to argue their different readings and reveal widely different tastes and interpretations. Conscious of their own struggles with writing poetry and fiction, the student-editors, without direction or intervention, developed an interpretive community very much like that outlined by Stanley Fish in "Is There a Text in This Class?"

Anderson, Philip M., and Sunstein, Bonnie S. "Teaching the use of metaphor in science writing." Paper presented at the 38th Annual Meeting of the Conference on College Composition and Communication, 1987. 25pp. [ED 281 204]

A freshman writing assignment sequence encouraged students to use metaphors to think their way through scientific topics, improving their writing skills in the process. Reading material was chosen for its use of metaphors to explain scientific topics. The writing component began with the students' own sometimes sketchy technical and scientific knowledge. At first, the students simply explored their topics. Later they were required to shift psychologically from the writer's or participant's role to the reader's or spectator's role. This revision stage also included shifting from the transactional to the poetic and from simile to metaphor. The students found that metaphors made a fluent connection between their personal experience and a scientific model, and they were encouraged to reflect on how they had benefited from the stages of the assignment sequence and to examine their own cognitive growth.

Barnes, Douglas, *et al.* "Group talk and literary response," *English in Education*, 5 (3), 1971, pp. 53-76. [EJ 051 312]

Article examines some of the processes by which a group of pupils work together to create a group response which will be acceptable to all of them while bringing their private responses to a sharper focus.

Betts, George T., and Neihart, Maureen. "Implementing self-directed learning models for the gifted and talented," *Gifted Child Quarterly, 30* (4), Fall 1986, pp. 174-177. [EJ 345 440]

This article reviews the history of self-directed learning for the gifted and describes the Autonomous Learner Model (Betts, 1985), which includes a strong affective component, career development, and guidelines for a process-based scope and sequence. Guidelines are provided for developing independent study programs for gifted learners.

Bowman, Richard F., Jr. "The personal student journal: Mirror of the mind," *Contemporary Education, 55* (1), Fall 1983, pp. 25-27. [EJ 288 960]

The personal student journal is a little-used technique that holds special promise for instructors working in diverse educational settings. Journals can be used to nurture self-directed learning and personal growth.

Brown, Ann L. "Teaching students to think as they read: Implications for curriculum reform," Reading Education Report No. 58. Washington, D.C.: American Educational Research Association, 1985. 42pp. [ED 273 567]

Describes an instructional program in which the techniques of expert scaffolding of materials and reciprocal teaching through dialogue are used. The dialogue includes spontaneous discussion and argument and four main comprehension-fostering activities. summarizing, questioning, clarifying, and predicating. Implications for reading comprehension are discussed.

Brown, Ann L., and Palincsar, Annemarie Sullivan. "Reciprocal Teaching of comprehension strategies: A natural history of one program for enhancing learning," Technical Report No. 334. Cambridge, Massachusetts: Bolt, Beranek and Newman, 1985. 103pp. [ED 257 046]

The first part of this report reviews an extensive series of studies concerned with the reciprocal teaching of comprehension and monitoring strategies – an instructional method in which an adult teacher and a group of students take turns leading a dialogue aimed at revealing the meaning of the text.

Buckler, Patricia Prandini. "Reading, writing, and psycholinguistics: An integrated approach using Joyce's 'Counterparts,'" *Teaching English in the Two-Year College, 12* (1), February, 1985, pp. 22-31. [EJ 313 631]

Explains how, in a second-semester freshman composition course, Louise Rosenblatt's model for the process of reading literature was used with James Moffett's concept of the process of writing to create a linked series of reading-writing exercises based on Joyce's "Counterparts."

Carr, David. "Self-directed learning in cultural institutions," *New Directions for Continuing Education, 25*, March 1985, pp. 51-62. [EJ 313 259]

Museums, libraries, zoos, parks, historical sites, and other cultural institutions can be vehicles for much self-directed learning. This article reviews these opportunities and efforts to utilize them.

Chang, Gen Ling, and Wells, Gordon. "The literate potential of collaborative talk." Paper presented at the Meeting of the International Oracy Convention, 1987. (Norwich, Norfolk, England, March 30-April 3.) 29pp. [ED 288 222]

Noting that collaboration can enhance children's ability to solve problems of increasing difficulty, this paper discusses the theory of collaborative talk in the classroom and how it can be applied.

Chase, Nancy D. "Reader response techniques for teaching secondary and post-secondary reading," College Reading and Learning Assistance Technical Report 85-07. Atlanta, Georgia: Georgia State University, Division of Developmental Studies, 1985. 12pp. [ED 263 535]

This paper describes a five-step technique for secondary and post-secondary reading instruction, compatible with reader response theory, and addressing the need for academically underprepared students to experience the validation of their personal responses to texts.

Coles, Nicholas. "Beyond interpretation: Writing about reading a poem." Paper presented at the 75th Annual Meeting of the National Council of Teachers of English, 1985. 10pp. [ED 269 781]

Semiotics, which treats language as a system of signs, may be the most appropriate method of analysis of poetry because it increases students' awareness of the fact that poems consist of something besides the thoughts and feelings of the poet. Ideally, students should learn to articulate and test their conceptions of what poetry is and how one reads it.

Comprone, Joseph J. "The function of text in a dialogic writing course." Paper presented at the Annual Meeting of the Kentucky Philological Association, 1987. 29pp. [ED 284 239]

Focusing on recent composition theory, this paper offers suggestions for writing teachers in applying concepts of dialogic discourse directly to the pedagogy of the college writing course.

Daugherty, Thomas, *et al.* "Using computers to construct knowledge and enhance teacher-child interactions." Paper presented at the 15th Annual Symposium of the Jean Piaget Society, 1985. 31pp. [ED 264 935]

Although inappropriate computer experiences emphasizing things more than people are frequently introduced into elementary school classrooms by inadequately trained administrators and teachers, computers can be appropriately used to liberate or empower thinking abilities. In essence, appropriate computer use should be viewed as a methodological hybrid, seen as an important media only when and where it offers significant instructional experiences. Teachers should have the time, in-service experience, and the security within the school system to use the computer to create a milieu in which students become hypothesis-testers with critical thinking abilities, and not fixed reality constructions. Appended mate-

rials illustrate the use of the computer to facilitate thought and describe various appropriate uses.

Dudley-Marling, Curt, and Searle, Dennis. "Enriching language learning environments for students with learning disabilities," *Journal of Learning Disabilities, 21* (3), March 1988, pp. 140-143. [EJ 368 902]

The article presents four guidelines for developing favorable classroom language learning environments for learning disabled students including a physical setting which promotes talk; opportunities to interact and use language, opportunities to use language for a variety of purposes and audience, and a responsive teacher who encourages continued talk.

Edmiston, Brian, *et al.* "Empowering readers and writers through drama: Narrative theater," *Language Arts, 64* (2), February 1987, pp. 219-228. [EJ 346 934]

Describes a process called narrative theater that involves 1) the exploration of texts and the stories likely embedded within them, 2) a learning process that involves the creation of drama contexts, and 3) the use of theater conventions.

Greenberg, Joel, and Rath, Christine. "Empowering students through writing," *Educational Leadership, 42* (5), February 1985, pp. 10-13. [EJ 313 666]

When they write on topics with personal meaning and read one another's papers to see whether they are communicating, even hard-to-teach students recognize the power of language and their ability to use it.

Kelder, Richard. "Entering a discourse community: Writing as a mode of learning in a content course." Paper presented at the 38th Annual Meeting of the Conference on College Composition and Communcation, 1987. Atlanta, Georgia. 21pp. [ED 286 210]

Assigned to teach a freshman composition course with a history and reading co-requisite, a New York college instructor developed a course in which students would begin to see history—through their reading, writing, and thinking—as a series of events intricately connected with their lives and the way they look at the world.

Kirby, Dan, and Kuykendall, Carol. *Thinking Through Language. Book One.* Urbana, Illinois: National Council of Teachers of English, 1985. 121pp. [ED 260 434]

One of three related documents produced in response to a need for direct instruction in thinking skills, this program for middle school or junior high school students bases its approach on involvement of students in direct experiences. Unit 1. "Experiencing the Arts" begins with ways sensory impressions trigger thought, describes a class art festival, and discusses the writing of personal reflections on thinking like an artist. Unit 2. "Exploring Possibilities" engages students in speculative and imaginative thinking about technology and its future applications, and includes such activities as brainstorming, making an invention, and preparing for an inventors' fair. Unit 3. "Investigating the Issues" engages students in a study of their own school, and involves them in asking questions, collecting, analyzing, and synthesizing information, and interpreting and evaluating findings. Unit

4. "Probing the Future" challenges students to project, predict, forecast, plan, and imagine what life might be like in the future.

Laster, Janet F. "A practical action teaching model," *Journal of Home Economics*, 74 (3), Fall 1982, pp. 41-44. [EJ 267 914]

This article presents the Practical Action Teaching Model and discusses its four phases: identification of the practical problem, practical reasoning or deliberation, action, and reflection. It incorporates intrinsically motivating, practical, value-based student problems that call for critical and creative thinking and offer opportunities for self-knowledge and concept development.

Lindquist, Donna Bishop. "Joining the literacy club," *Reading Teacher*, 41 (7), March 1988, pp. 676-680. [EJ 368 666]

Presents firsthand observations of a successful twenty-day reading program involving one student who was transformed from a passive, reluctant, indifferent learner to one who acquired ownership for his learning and empowerment over the reading process.

Maxwell, Laurie, and Paulu, Nancy (Ed). "Eight pointers on teaching children to think. Research in brief." Washington, D.C.: Office of Educational Research and Improvement, 1987 3pp. [ED 277 992]

Based on the research report "Thinking Skills" by Robert J. Marzano and C. L. Hutchins, this paper offers pointers on teaching children to think.It is suggested that educators teach students how to choose the information they want to remember and that students learn to examine their attitudes about learning and to evaluate their own progress.

Mirman, Jill, and Tishman, Shari. "Infusing thinking through 'Connections,'" *Educational Leadership*, 45 (7), April 1988, p. 64. [EJ 370 300]

"Connections" is a program to help teachers infuse decision-making, problem-solving, communicating, and understanding into all subjects. Students work in small groups to apply each strategy to what they are studying, and to transfer strategies between subjects and to the real world.

Newton, David E. *Science and Social Issues* (Rvd. ed.). Portland, Maine: J. Weston Walch, 1987. [ED 281 755; not available from EDRS.]

Developed to help teachers and students deal with some of the current issues in science and technology, this book outlines a system for studying socioscientific problems that can be developed in class and then be applied in a life setting. Issues related to the biological sciences, physical sciences, and science as a social institution are addressed.

Nugent, Harold, and Nugent, Susan. "The double-entry journal in literature classes." Paper presented at the Annual Meeting of the New England Association of Teachers in English Fall Conference, 1984. 14pp. [ED 252 862]

The double-entry journal requires students to write effective response statements to literature readings and to compare such entries with those of classmates. Use of the double-entry journal is intended to activate students' prior learning and present feelings,

foster collaborative learning, integrate major language skills, and encourage creative and discovery processes.

Parker, Robert P., and Goodkin, Vera. *The Consequences of Writing: Enhancing Learning in the Disciplines.* Upper Montclair, New Jersey: Boynton/Cook Publishers, 1987. [ED 272 928; not available from EDRS.]

Intended for teachers of grades 7-16, this book discusses "Heuristic" writing—writing that produces new, irreversible knowledge for the writer leading to a fuller understanding of the self and of the act of writing—as well as principles and practices having direct implications for a wide range of students.

Peters, Richard. "Modeling to enhance critical thinking and decision-making skills development in the instructional process: The social studies," 1987. 26pp. [ED 287 781]

Teachers need to blend structure and spontaneity into meaningful learning experiences and incorporate these experiences into instructional strategies and curriculum. The Proactive Action Model (PAM) strategy is one way to blend structure and spontaneity into meaningful learning experiences. The PAM strategy is an inquiry-based learning model in which students: 1) identify a conflict/issue/problem, 2) research data and generate an hypothesis; 3) conduct an empirical study, collect data, and arrive at a conclusion, and 4) design a resolution strategy.

Runions, Ted, and Smyth, Elizabeth. "Mentorships for the gifted and talented," 1985 Digest. Reston Virginia: ERIC Clearinghouse on Handicapped and Gifted Children, 1985. 3pp. [ED 262 512]

The digest considers the operation and function of mentorships in gifted and talented education. Defined as learning partnerships between two or more individuals regarding a mutual interest, mentorships are designed to differentiate the curriculum through such means as creating opportunities for learner access to professional expertise in the community, offering real-life experiences, establishing a network of community resource people, and providing leadership opportunities through tutoring between and among elementary and secondary school students.

Scardamalia, Marlene, *et al.* "Computer supported intentional learning environments." Paper presented at the Annual Meeting of the American Educational Research Association, 1987. 10pp. [ED 288 913]

Computer Supported Intentional Learning Environments (CSILE) is a project using computer software to promote the constructive processes involved in intentional learning. CSILE enables groups of students to build a collective database (knowledge base) of their thoughts, in the form of pictures (created by students using a color graphics editor) and written notes.

Siegel, Marjorie. *Toward an Understanding of Reading as Signification,* 1983. 40pp. [ED 246 388]

To explore how readers create textual meanings or interpretations from written materials, a study that investigated reading from a semiotic perspective was conducted. Findings suggested that children's interpretations were influenced by their embedded

theories of the social situation, their skills as artists, and the nature of the activity of sketching. Within-class friendships and interest also played major roles in the process of constructing meaning.

Stanford, Barbara Dodds, and Stanford, Gene. "Thinking through language. Book Two." Urbana, Illinois: National Council of Teachers of English, 1985. 114pp. [ED 260 435]

One of three related documents produced in response to a need for direct instruction in thinking skills at the secondary level, this program for high school students bases its approach on involvement of students in direct experiences. Designed to build on the thinking skills that the student already possesses and, ideally, on the experience gained in Book One, it provides training in analytical skills as well as systematic development of intuitive skills.

Stark, Sheila. "Developing critical and creative thinking through the use of the Synectics Teaching Model," *Illinois Teacher of Home Economics, 30* (4), March-April 1987, pp. 154-156. [EJ 350 288]

The author shares how she used the Synectics Model in a class she taught on Family and Communication at the undergraduate level. The model encourages students to develop new ideas using their nonrational and emotional states of mind, and is intended to increase creativity, empathy, and problem-solving.

Stotsky, Sandra. "Imagination, writing, and the integration of knowledge." Revised version of a paper presented at the Annual Meeting of the New England Association of Teachers of English, 1983. 45pp. [ED 239 260]

Effective informational writing assignments show students that creativity and imagination are essential to the generation of new ideas in all content areas. A collection of these assignments has been arranged into five categories of increasing complexity based on the following criteria. whether the point of view is assigned as self-selected; whether the imagined audience for the text is informal or formal, whether the imagined point of view is that of a real or anonymous historical person, whether students are asked to assume one or more than one point of view, and whether students are asked to reorganize information in a new way. These assignments encourage an integration of facts and ideas from various perspectives, give students the opportunity to write for different purposes and audiences in the content areas, permit historical and scientific information to be presented in a nonexpository form, and encourage students to think about the feelings and attitudes of others.

Wilcox, Ray T. "Rediscovering discovery learning," *Clearing House, 61* (2), October 1987, pp. 53-56. [EJ 359 233]

Discusses the benefits of discovery learning, as opposed to a direct, lecture method, and offers 10 discovery strategies, such as playing 20 Questions, using the Socratic Method, and problem solving.

Willard, Diane E., and Roeder, A. Catherine. "Through the looking glass: High tech and terrapin," *G/C/T, 9* (3), May-June 1986, pp. 30-31. [EJ 335 937]

Gifted elementary students get an opportunity to explore, research, and create knowledge via a LOGO computer environment.