

Making Critical Thinking Intuitive

Teaching For Intuitive Understanding

The meaning of “intuitive” we are using in this chapter makes no reference to a mysterious power of the mind, but rather to the phenomenon of “quick and ready insight” (Webster’s New Collegiate Dictionary). This sense of the word is connected to the everyday fact that we can learn concepts at various levels of depth. When, for example, we memorize an abstract definition of a word and do not learn how to apply it effectively in a wide variety of situations, we end up without an intuitive foundation for our understanding. We lack the insight, in other words, into how, when, and why it applies. Children may know that the word ‘democracy’ means “a government in which the people rule”, but may not be able to tell whether they are behaving “democratically” on the playground. They may know what the word ‘cruel’ means, but they may not recognize that they are being cruel in mocking a handicapped student.

Helping students to develop critical thinking intuitions is, then, helping them gain the practical insights necessary for a quick and ready application of concepts to cases in a large array of circumstances.

We want critical thinking principles to be “intuitive” to our students in the sense that we want those principles ready and available in their minds for immediate translation into their everyday thought and experience. We base this goal on the assumption that concepts and ideas are truly understood only when we can effectively and insightfully use them in a wide range of circumstances, only when we have mastered their use to the point of spontaneous application. (See chart on the next page.)

Unfortunately much of what we originally learned in school as children was abstract and unconnected to everyday life and experience. And, since it is natural to teach as one was taught, our own students are probably doing precisely what we previously did: “learning” in an abstract way, learning, in other words, to perform for grades and approval, not to gain knowledge, skill, and insight, not to transform their behavior in the “real” world.

This, then, is probably the fundamental reason why so much school learning is not effectively transferred to real life. It lacks the intuitive basis, the insights, for the translation. When we were students, our own teachers rarely took pains to ensure that we intuitively understood the basic concepts we were learning. Hence their teaching did not model for us teaching that fosters intuitive learning. As a result we are rarely sufficiently aware of the similar effect of our own teaching. As long as students are performing in certain standard ways, we often uncritically assume they “understand”, that they are building a basis for using what they learn, that they will eventually be able to take what they learn and put it to use in the everyday world. This assumption is rarely justified.

As a first step toward preparing to help our students develop intuitive understandings of critical thinking concepts, we must make sure that the basic concepts that underlie critical thinking are intuitive to us. To help our students internalize the understandings essential to critical thought, we must ourselves gain practice in translating those same understandings into the context of our own lives. We must, in other words, internalize the basic concepts and principles of critical thinking so deeply that we habitually use them in all of the various dimensions of our own lives: as parents, consumers, teachers, and citizens, so that when we teach we teach in a way that helps our students translate all fundamental and root concepts and principles into the circumstances of their own day-to-day life. (See chart on the next page.)

Both we and our students, in other words, need to develop full-fledged critical thinking intuitions. This is, of course, a matter of long-term development. Neither we nor they can develop deep intuitions overnight. Nevertheless, from the beginning we must proceed with a sense of what we are aiming at. We must begin with an initial sense of what it is to develop intuitions. Then we must progressively deepen that sense as we explore a variety of ways of fostering critical thinking intuitions. The primary goal of this chapter is to lay a foundation for this understanding. All of the rest of the handbook will provide further examples to build upon as to the nature and importance of “intuitive” teaching.

To accomplish this end, we shall take a couple of the most fundamental distinctions that underlie critical thinking and illustrate how they can be made intuitive to children. At the same time, we will illustrate how these concepts can become more intuitive to us as teachers. Of course, we shall not attempt to cover all of the important distinctions but merely to illustrate the process of teaching for intuitive understanding. As you read, the kinds of essential “translations” required to help students ground basic concepts in basic insights should become progressively clearer.

We shall assume that you will pursue analogous strategies for the various other basic concepts in critical thinking on your own. Remember, the aim is an on-going commitment to the process of fostering an intuitive basis for all the principles of critical thinking, a commitment to the process of engaging students continually in translating back and forth between the abstract and the concrete, the general and the particular, the academic and the “real”.

Inferences and Assumptions

Learning to distinguish inferences from assumptions is another important distinction in critical thinking. It is therefore a good place to develop basic intuitions. In this case, we will not begin by developing characters who illustrate the concepts, we will instead explore alternative ways to make them vivid and practical, first to you the teacher, through a wide variety of everyday examples intelligible to adults. Then I will turn my

attention more and more to the process by which we can help make these concepts more vivid to children. As before let us begin with a couple of abstract and general explanations of the concepts:

Inference: An inference is a step of the mind, an intellectual act by which one concludes that something is so in light of something else's being so, or seeming to be so. If you come at me with a knife in your hand, I would probably infer that you mean to do me harm. Inferences can be strong or weak, justified or unjustified.

Assumption: An assumption is something we take for granted or presuppose. All human thought and experience is based on assumptions. Assumptions can be unjustified or justified, depending upon whether we do or do not have good reasons for what we are assuming.

For example, I heard a scratch at the door. I got up to let the cat in. I assumed that only the cat makes that noise, and that he makes it only when he wants to be let in.

We humans have no trouble actually making assumptions and inferences, for we make them, not only every day of our lives, we make them every moment of everyday of our lives (at least, every waking moment of our lives). Assumptions and inferences permeate our lives precisely because we cannot act without them. Our lives are conducted almost exclusively on the basis of the judgments, the interpretations, and the beliefs we form. Each is the result of the mind's ability to come to conclusions, to give meanings to what we experience, in short, to make inferences. And the inferences we make depend on what we take for granted, what we assume, as we attempt to make sense of what is going on around us.

Put a human in any situation and he or she starts to give it some meaning or other. People automatically make inferences to gain a basis for understanding and action.

So quickly and automatically do we make inferences that we do not, without training, learn to notice them as such. We see dark clouds and infer rain. We hear the door slam and infer someone has arrived. We see a frowning face and infer the person is angry. Our friend is late and we infer she is being inconsiderate. We meet a tall boy and infer he is good at basketball, an Asian and infer he will be good at math. We read a book, and infer what the various sentences and paragraphs, indeed what the whole book, is saying. We listen to what people say, and make a continual series of inferences as to what they mean. As we write we make inferences as to what others will make of what we are writing. We make inferences as to the clarity of what we are saying, as to what needs further explanation, as to what needs exemplification or illustration.

Many of our inferences are justified and reasonable. But many are not. One of the most important critical thinking skills is the skill of noticing and reconstructing the inferences we make, so that the various ways in which we inferentially shape our experiences become more and more apparent to us. This skill, this sensitivity or ability, enables us to separate our experiences into analyzed parts. We learn to distinguish the raw data of our experience from our interpretations of those data (from, in other words, the

inferences we are making about them). Eventually we realize that the inferences we make are heavily influenced by our point of view and the assumptions we have come to make about people and situations. This puts us in the position of being able to broaden the scope of our outlook, to see situations from more than one point of view, to become more openminded. (See chart on the following page.)

Often, of course, different people make different inferences because they bring to situations a different point of view. They see the data differently. Or, to put it another way, they have different assumptions about what they see. For example, if two people see a man lying in a gutter, one might infer, "There's a drunken bum". The other might infer, "There's a man in need of help." These inferences are based on different assumptions about the conditions under which people end up in gutters and these assumptions are connected to the point of view about people that each has formed. The first person assumes: "Only drunks are to be found in gutters". The second person assumes: "People lying in the gutter are in need of help".

The first person may have developed the point of view that people are fundamentally responsible for what happens to them and ought to be able to take care of themselves.

The second may have developed the point of view that the problems people have are often caused by forces and events beyond their control.

In any case, as soon as possible, we want to help our students begin to notice the inferences they are making, the assumptions they are basing those inferences on, and the point of view about the world they are developing. To help our students do this we need to give them clear examples of simple cases, and lots and lots of practice analyzing and reconstructing them. For example, we could reconstruct the above inferences in the following way:

Person One

Situation: "A man is lying in the gutter."

Assumption: "Only bums lie in gutters."

Inference: "That man's a bum."

Person Two

Situation: "A man is lying in the gutter."

Assumption: "Anyone lying in the gutter is in need of help."

Inference: "That man is in need of help."

Our goal of sensitizing students to the inferences they make and to the assumptions that underlie their thinking enables them to begin to gain command over their thinking. Because all human thinking is inferential in nature, our command of our thinking depends on command of the inferences embedded in it and thus of the assumptions that underlie it.

Consider the way in which we plan and think our way through everyday events. We think of ourselves as washing up, eating our breakfast, getting ready for work, arriving on time, sitting down at our desk, making plans for lunch, paying bills, engaging in small talk, etc. Another way to put this is to say that we are continually interpreting our actions, giving them meanings, making inferences about what is going on in our lives. And this is to say that we must choose among a variety of possible meanings. For example, are we “relaxing” or “wasting time”? Am I being “determined” or “stubborn”, or worse, “pig-headed”. Am I “joining” a conversation or “butting in”? Is someone “laughing with me” or “laughing at me”? Am I “helping a friend” or “being taken advantage of”? Every time we interpret our actions, every time we give them a meaning, we are making one or more inferences on the basis of one or more assumptions.

As humans we continually make assumptions about ourselves, our jobs, our mates, our children, about the world in general. We take some things for granted, simply because we can't always be questioning everything. Sometimes we take the wrong things for granted. For example, I run off to the store (assuming that I have enough money with me) and arrive to find that I have left my money at home. I assume that I have enough gas in the car only to find that I have run out. I assume that an item marked-down in price is a good buy only to find that it was “marked up” before it was “marked down”. I assume that it will not, or that it will, rain. I assume that my car will start when I turn on the key and press the starter. I assume that I mean well in my dealings with others. We make hundreds of assumptions without knowing it, that is, without thinking about it. Most of them are quite sound and justifiable. Some however are not.

The question then becomes: “How can we teach young children to begin to recognize the inferences they are making, the assumptions they are basing those inferences on, and the point of view, the perspective on the world that they are beginning to form?”.

It seems to me that there are many ways to foster children's awareness of their inferences and assumptions. For one thing, all disciplined subject matter thinking requires that we learn to make correct assumptions about the content of what we are studying and that we become practiced in making justifiable inferences. For example, in doing math we make mathematical assumptions and mathematical inferences; in doing science we make scientific assumptions and scientific inferences; in constructing historical accounts we make historical assumptions and historical inferences.

Every subject we teach provides us with opportunities for facilitating student recognition of inferences and assumptions. When students mis-read a mathematical problem, for example, they make the wrong inferences about it, usually as the result of having made false assumptions about it. The difficulty for us is usually not because there aren't many opportunities to foster these skills and recognitions. It is usually because we ourselves are not practiced in this very art, hence we miss most of the opportunities inherent in the everyday classroom.

Here is one place to start. We can give students exercises which they can do in groups which help both them and us become more aware of inferences, assumptions, and

points of view lurking behind them. We could start by asking the class collectively to identify common inferences. For example:

If it was 12:00 noon, what might you infer? (It's time for lunch.)

If there were black clouds in the sky? (It's probably going to rain.)

If Jack comes to school with a bump on his head? (He probably got hit.)

If there are webs in the corners of the ceiling? (Spiders made them.)

If Jill is in the 8th grade? (She is probably 13 or 14 years old.)

After some exercise of this sort, you could then switch to practice in small groups of the same sort. When you felt that the students were developing an intuitive grasp of inferences, you could then orchestrate some practice with assumptions, helping the students to see how the inferences they make are a result of the assumptions they bring to situations. For example:

If it was 12:00 noon and you inferred it was time for lunch, what did you assume? (That everyone eats lunch at 12:00 noon.)

If there are black clouds in the sky and you infer that it's probably going to rain, what did you assume?
(That it usually rains whenever there are black clouds in the sky.)

The same would hold for virtually any other "patriotic" image or symbol, such as the flag, the White House, George Washington crossing the Delaware, Abraham Lincoln reading by the light of the fire in a one room cabin. In other words, just as pictures and images can be used to make an abstract idea more concrete and intuitive, so also can they be used to obfuscate or obscure fundamental meanings and principles. Using an image as a tool for fostering critical intuitions must be understood to involve not only the grounding of abstract concepts in vivid case-by-case applications, but also the critique of associations that so often lead to a systematic misinterpretation of relevant ideals, concepts, and principles.

After all, what does the Statue of Liberty stand for? What does it imply? Were these implications true in all the days of our national past? And are they still true today? Today, for example, West Germany is the only country in the world that provides universal refuge to all children of every nationality who need shelter and protection. It provides free food, shelter and education to all such children. The U.S. does not. Does this mean that we have abandoned the ideal that the Statue of Liberty stands for? Student discussion of these questions helps develop insight into the deeper meanings that underlie traditional ideals of the United States and the problems involved in living in accord with those ideals.

Using Dramatization to Foster Critical Thinking Intuitions

The Power of the Dramatic

The world that is most real to us is the world of actual persons dreaming, hoping, planning, acting out their lives, facing conflicts and problems, struggling to find happiness, success, and meaning. Abstract concepts become much more meaningful to us when we relate them directly to a dramatized world. That is why novels, plays, television programs and movies typically have much more appeal to and impact on us than abstract treatises do. One reason for this is that there is a direct relationship between stories and experiences. We learn about the world principally through our experiences of it and our experiences, from the beginning, are “story-like” in character.

When we talk about ourselves we tell others the story of our lives, as it were. Furthermore, most of our real beliefs are embodied in our actions and in what our actions “mean” to us. A powerful way to make the abstract more intuitive, is, therefore, to use stories and dramatized characters for that purpose. In this section, we will illustrate this point by the use of three fictional characters to illustrate three abstract concepts.

Uncritical, Selfish, and Fairminded Critical Thinkers

The distinctions between uncritical thinking and critical thinking, on the one hand, and between selfish and fairminded critical thinking on the other hand, underlie our whole approach to critical thinking. It highlights the danger of focusing on critical thinking skills alone, independent of critical thinking values. It continually calls to our attention the need to attend to the intellectual and moral standards our students are forming as a result of the way we are cultivating their learning.

A basic, though abstract, explanation for the differences between uncritical, selfish critical, and fairminded critical persons is given in the following brief characterizations:

1. Uncritical persons are those who have not developed intellectual skills, persons who are naive, conformist, easily manipulated, often inflexible, easily confused, typically unclear, narrowminded, and consistently ineffective in their use of language. They may have a good heart but they are not able to skillfully analyze the problems they face so as to effectively protect their own interests.
2. Selfish critical persons are skilled thinkers who do not genuinely accept the values of critical thinking, persons who use the intellectual skills of critical thinking selectively and self-deceptively to foster and serve their vested interests (at the expense of truth). They are typically able to identify flaws in the reasoning of others and refute them and to back up their own claims with plausible reasons,

but they have not learned how to reason empathically within points of view with which they disagree.

3. Fairminded critical persons are skilled thinkers who do accept and honor the values of critical thinking, persons who use the intellectual skills of critical thinking to accurately reconstruct the strongest versions of points of view in conflict with their own and to question deeply their own framework of thought. They try to find and correct flaws in their own reasoning and to be scrupulously fair to those with whom they disagree.

This is fine as far as it goes, but how are we to make these abstractions more real to our students? And how are we and our students to see the significance of these distinctions in the everyday world?

It may seem to us that these theoretical discriminations are much beyond the grasp of our students. But whether they are or are not, is not a matter of the distinctions themselves, but of the way they are introduced to students. In fact, it is important for children to begin to grasp these differences as soon as possible. Let us now examine how we might use dramatization as a strategy for making these critical thinking concepts more intuitive.

Naive Nancy, Selfish Sam, and Fairminded Fran

One of the ways to aid students in developing critical thinking intuitions is to create characters whose dramatic personalities illustrate abstract distinctions. For example, we have created three imaginary children whose characters and personalities illustrate the contrast between the uncritical thinker, the selfish critical thinker, and the fairminded critical thinker. We can get some insight into the distinction by imagining what each of these characters might say about themselves if they had a clear sense of the person they were becoming and a willingness to be candid and forthright. Children who were actually developing these contrasting behavior patterns and traits would probably not, of course, have the insight suggested by these hypothetical self-descriptions.

First meet Naive Nancy. Here is what she might say of herself (if she could clearly see how she uses thinking to deal with the world):

“I don’t need to think! I understand everything without thinking. I just do whatever occurs to me to do. I believe most of what I hear. I believe most of what I see on TV. I don’t see why I should question either. And I don’t need to waste a lot of time trying to figure things out. Why should I, when someone will figure things out for me if I wait long enough. It’s a lot easier to say “I can’t!” than to do a lot of work. My parents and my teachers take care of me when I can’t take care of myself. The other day I was having trouble with my math homework and started to cry, so my father did it for me. My parents give me a lot of help. It’s easier that way. I do what I’m told, keep my mouth shut, and go along with whatever my friends decide. I don’t like to make waves. Thinking gets you into trouble.”

Next meet Selfish Sam. Here is what he might say (if he could clearly see how he uses thinking to deal with the world):

“I think a lot! It helps me trick people and get what I want. I believe whatever I want to believe, whatever gets me what I want. I question anyone who asks me to do what I don’t want to do. I figure out how to get around my parents. I figure out how to get other kids to do what I want them to do. I even figure out how to avoid thinking if I want. Sometimes I say “I can’t!” when I know I could but don’t want to. You can get what you want from people if you know how to manipulate them. Just the other night, I got to stay up till 11:00 by arguing with my mother about bedtime! It helps to tell people what they want to hear. Of course, sometimes what they want to hear isn’t true, but that doesn’t matter because you only get into trouble when you tell people what they don’t want to hear. You can always trick people if you know how. Guess what, you can even trick yourself if you know how.”

Next meet Fairminded Fran. Here is what she might say (if she could clearly see how she uses thinking to deal with the world):

“I think a lot. It helps me to learn. It helps me to figure things out. I want to understand my parents and my playmates. In fact, I even want to understand myself and why I do things. Sometimes I do things that I don’t understand. It’s not easy trying to understand everyone and everything. Lots of people say one thing and do another. You can’t always believe what people say. You can’t believe a lot of what you see on TV. People often say things not because they mean them but because they want things and are trying to please you. I would like to make the world a better place. I want to make it better for everyone, not just for me and my friends.

To understand other people you have to look at things as they do. You have to understand their situation and what you would feel like if you were them. You have to put yourself in their shoes. The other night I got mad at my sister because she wanted to watch a TV program that was on at the same time my favorite show was on. I didn’t want to let her until I realized that she needed to watch her program to do some homework for school. I knew then that it wouldn’t be fair of me to insist on my show, since she did have to do her homework for school. It isn’t easy to be fair. It’s a lot easier to be selfish and just think about yourself. But if I don’t think about others, why should they think about me? I want to be fair to others because I expect everyone to be fair to me.”

You may have noticed that we had each imaginary child introduce him or herself in terms of their attitudes toward thinking, how they go about thinking, and what they aim to achieve through their thinking. Each of these dimensions of character are important.

Naive Nancy does not see much reason to think at all. She takes things as they come. She believes what she hears. She usually goes along with whatever her peers say. She intends no harm but also assumes that no one else is going to harm her. She is a ready victim for more sophisticated manipulators: adults or children. Naive Nancy will make a

good student only insofar as thought is not required. She will literally, and thoughtlessly, do what she is told. She doesn't question or try to understand her own motives. She will make mistakes because she doesn't know how to listen closely and monitor what she hears for accuracy of interpretation.

Wherever mindless obedience succeeds, she will get by. What is more, much of the time her innocent "helplessness" will enable her to get others to do things for her. Rather than try to think her way through a difficulty, she is learning to say "I can't do it!" after the first or second try. She is finding out that she can usually get by without much thinking. Her innocent likeability and perpetual "incompetence" is both her strength and her (ultimate) downfall. Her only real thinking skills are in the art of being helpless, in enticing others to do her thinking for her.

Selfish Sam contrasts well with Naive Nancy. Sam values thinking. And the more he does it, the more he values it. But only in a special sense. He thinks to gain advantage, to get what he wants, to successfully put his desires above the rights and needs of others. To put it briefly, Sam is discovering the power of con-artistry. Sam is discovering that you can best get what you want by focusing clearly on your own desires, figuring out what is standing in the way of your interests, and manipulating others into acting in your interest. Selfish Sam is becoming an egocentric problem solver. He defines his problems so as to center them around getting what he wants for himself. Sometimes this means figuring out how to get out of work. But unlike Nancy, Sam is learning the power of figuring things out for himself.

He is also learning how to impress both adults and kids by what he can do. Eventually Sam will come to appreciate the power there is in groups, the advantages one gains by becoming a leader and exercising control over others. He will use his thought to win others to his side, to defeat his "enemies" (whoever he doesn't like), and extend his power and advantage over others. It isn't that he doesn't care at all about others, but rather that he cares only about those who serve him, those who are members of his group. Eventually, Sam could become an effective promoter of a vested interest, an excellent sales person, a politician, or a lawyer ... any job that can "successfully" be performed without a well-developed sense of fairmindedness.

Fairminded Fran contrasts well with both Nancy and Sam. Like Sam, Fran is learning the power of thought. She is learning the value of figuring things out for herself. Unlike Nancy, she is not learning the art of "helplessness" because she is experiencing the pleasure and deep satisfaction that comes from successfully figuring things out for herself. She is discovering that she has a mind and can use it to solve problems, protect herself, do difficult jobs, learn complicated things, express herself well, and get along with others. But that is not all she's learning. She is also learning that other people have minds, other people have desires and needs, other people have rights, and other people have a different way of looking at things. She is learning how to enter into the thinking of others, how to see things from other people's point of view, how to learn from other people's perspective. She is beginning to notice the need to protect herself from

the “Sam’s” of the world. She is learning to test for herself what people say. She is learning to protect her interests without violating the rights of others.

Fran’s thinking is beginning to develop a richness that Sam’s will never develop (as long as he thinks selfishly), for she is learning how much one can learn from others. Eventually, Fran will gain many insights from the art of thinking within the perspective of others that she is developing. Fran’s early thinking is laying the foundation for later breadth of vision. Fran’s ability to think for herself in a skilled and fairminded way will enable her to pursue any career goal that she later takes on. She will be highly valued by those who value justice and fair play. But she will also be treated with suspicion by the “true believers”, by the people whose first allegiance is to a special group, to “our side”. Those given to group think will come to recognize that you can’t depend on Nancy to always support the “right” side (our side). She sometimes agrees with the enemy, the opposition, the “other guys”.

By introducing these characters, we can help make a basic distinction in critical thinking more alive and vivid to our students. We can breathe life into these important ideas and help our students build mental bridges between the abstract and the concrete, between the theoretical and the practical. There are, of course, a variety of ways that we might use these characters. We could, for example, develop stories about their adventures together, stories in which their interactions in a variety of situations further illuminate their contrasting modes of thinking and judging. We might make pictures and visuals which gave illustrated commentary from each of the characters about how to behave and act in various situations. We might have discussions with our students about which of these characters they thought they were most like and why, or what they liked or did not like about each of these characters. We could also ask if they ever acted like Naive Nancy or Selfish Sam, and then to explain, if some said yes, what it is that they did and why.

How many ways we find to make use of these dramatizations of contrasting modes of thinking entirely depends on the limits of our own imaginations. The important point is this: students learn deeply only those things they translate into their own experience and which make deep contact with their emerging values.

If you now review the above abstract definitions of the terms uncritical, selfishly critical, and fairmindedly critical and compare what you learned from Nancy, Sam, and Fran, you will have a basis for recognizing the importance of critical thinking intuitions. Students who gain an intuitive grasp of the differences among Nancy, Sam, and Fran will have the insights necessary to recognizing similar patterns of behavior in themselves and others.

Now let’s turn our attention to another important distinction in critical thinking and experiment with a somewhat different process of making ideas more intuitive.

Exemplification: Understanding Abstract Concepts Through Vivid Everyday Examples

The Power of Examples

Everything in the natural world is concrete and particular. Whatever is abstract must ultimately translate, therefore, into what is concrete and particular. Giving examples, is a powerful way to help students learn. Furthermore, one of the best ways to assess student learning is to determine the extent to which they can give examples of what they are learning. In this section, we will illustrate how examples can be used to make abstract concepts intuitive. We will focus on two: inference and assumption.

Imagination as a Form of Visualization

Critical thinking requires an extensive use of the student's imagination. Whenever we think about abstract meanings, whenever we try to understand or assess a statement or belief, whenever we attempt to predict a consequence, or determine the implications of an action, we need to use our imaginations effectively. Most students are not practiced in this use of their imaginations. They often find it difficult to conjure up circumstances that exemplify abstract meanings. For example, suppose we ask students to describe a circumstance in which some person was behaving in an unquestionably honest way. Most students find it difficult to imagine a case when called upon to do so. Very few would say something like: "Well, if I found your wallet on the playground and nobody knew I found it, but I still returned it to you — that would be being honest." They recognize the case when someone else thinks it up, but they often have difficulty in thinking them up, imagining them, on their own.

One of the reasons for this deficiency is the failure at all levels of education to teach in a way that fosters intuitive learning. If we focused attention, as we should, on the ability of students to move back and forth comfortably and insightfully between the abstract and the concrete, they would soon develop and discipline their imaginations so as to be able to generate cases that exemplify abstractions. All students have, as a matter of fact, experienced hundreds of situations that exemplify any number of important abstract truths and principles. But they are virtually never asked to dig into their experience to find examples, to imagine cases, which illustrate this or that principle, this or that abstract concept.

The result is an undisciplined and underdeveloped imagination combined with vague, indeed muddled, concepts and principles. They are left with experiences that are blind, experiences from which they learn few truths, ideas that are empty, that they cannot relate perceptively to their experience. What is missing is the intuitive synthesis between concept and percept, between idea and experience, between image and reality.

Conclusion

Some people erroneously believe that critical thinking and intuitive thinking are incompatible opposites. If one means by intuitive thinking a form of inexplicable, non-rational thought, the claim is correct, for critical thinking is always both intelligible and rational. But if one means by intuition the process by which one translates the abstract into the concrete, based on insight into the principles upon the basis of which one is thinking, then not only are critical and intuitive thinking not incompatible, they are necessarily conjoined. Solid critical thinking always requires fundamental insights, fundamental intuitions, to guide it.

If this is true, then teachers committed to fostering the critical thinking of their students must interest themselves in the means by which critical thinking intuitions are formed and developed. The dramatic, the concrete, and the highly visual and imaginative, are crucial instrumentalities for this purpose. Properly used they inevitably foster reflective intuition and insight. Whatever we are teaching, we should therefore continually ask ourselves, "What are the intuitions and insights essential to this mode of knowledge and thought?" and "How can I most effectively foster them with these students?"