Persisting

Efficacious people stick to a task until it is completed. They don't give up easily. They are able to analyze a problem, and they develop a system, structure, or strategy to attack it. They have a repertoire of alternative strategies for problem solving, and they employ a whole range of these strategies. They collect evidence to indicate their problem-solving strategy is working, and if one strategy doesn't work, they know how to back up and try another. They recognize when a theory or an idea must be rejected and another employed. They have systematic methods for analyzing a problem, which include knowing how to begin, what steps must be performed, what data must be generated or collected, and what resources are available to assist. Because they are able to sustain a problem-solving process over time, they are comfortable with ambiguous situations.

Students often give up when they don't immediately know the answer to a problem. They sometimes crumple their papers and throw them away, exclaiming "I can't do this!" or "It's too hard!" Sometimes they write down *any* answer to get the task over with as quickly as possible. Some of these students have attention deficits. They have difficulty staying focused for any length of time; they are easily distracted, or they lack the ability to analyze a problem and develop a system, structure, or strategy of attack. They may give up because they have a limited repertoire of problem-solving strategies, and thus they have few alternatives if their first strategy doesn't work.

Managing Impulsivity

Effective problem solvers are deliberate: they think before they act. They intentionally establish a vision of a product, an action plan, a goal, or a destination before they begin. They strive to clarify and understand directions, they develop a strategy for approaching a problem, and they withhold immediate value judgments about an idea before they fully understand it. Reflective individuals consider alternatives and consequences of several possible directions before they take action. They decrease their need for trial and error by gathering information, taking time to reflect on an answer before giving it, making sure they understand directions, and listening to alternative points of view. Often, students blurt out the first answer that comes to mind. Sometimes they shout an answer, start to work without fully understanding the directions, lack an organized plan or strategy for approaching a problem, or make immediate value judgments about an idea (criticizing or praising it) before they fully understand it. They may take the first suggestion given or operate on the first idea that comes to mind rather than consider alternatives and the consequences of several possible directions. Research demonstrates, however, that less impulsive, self-disciplined students are more successful. For example, Duckworth and Seligman (2005) found

Highly self-disciplined adolescents outperformed their more impulsive peers on every academic performance variable, including report-card grades, standardized achievement test scores, admission to a competitive high school and attendance. Self-discipline measured in the fall predicted more variance in each of these outcomes than did IQ, and unlike IQ, self-discipline predicted gains in academic performance over the school year. (p. 940)

Thinking About Thinking (Metacognition)

The human species is known as *Homo sapiens sapiens*, which basically means "a being that knows their knowing" (or maybe it's "knows *they're* knowing"). What distinguishes humans from other forms of life is our capacity for metacognition—the ability to stand off and examine our own thoughts while we engage in them.

Occurring in the neocortex, metacognition, or thinking about thinking, is our ability to know what we know and what we don't know. It is our ability to plan a strategy for producing the information that is needed, to be conscious of our own steps and strategies during the act of problem solving, and to reflect on and evaluate the productiveness of our own thinking. Although inner language, thought to be a prerequisite for metacognition, begins in most children around age 5, metacognition is a key attribute of formal thought flowering at about age 11.

The major components of metacognition are, when confronted with a problem to solve, developing a plan of action, maintaining that plan in mind over a period of time, and then reflecting on and evaluating the plan upon its completion. Planning a strategy before embarking on a course of action helps us keep track of the steps in the sequence of planned behavior at the conscious awareness level for the duration of the activity. It facilitates making temporal and comparative judgments; assessing the readiness for more or different activities; and monitoring our interpretations, perceptions, decisions, and behaviors. An example would be what superior teachers do daily: developing a teaching strategy for a lesson, keeping that strategy in mind throughout the instruction, and then reflecting upon the strategy to evaluate its effectiveness in producing the desired student outcomes.

Intelligent people plan for, reflect on, and evaluate the quality of their own thinking skills and strategies. Metacognition means becoming increasingly aware of one's actions and the effect of those actions on others and on the environment; forming internal questions in the search for information and meaning; developing mental maps or plans of action; mentally rehearsing before a performance; monitoring plans as they are employed (being conscious of the need for midcourse correction if the plan is not meeting expectations); reflecting on the completed plan for self-evaluation; and editing mental pictures for improved performance.

Interestingly, not all humans achieve the level of formal operations. As Russian psychologist Alexander Luria found, not all adults metacogitate. Although the human brain is capable of generating this reflective consciousness, generally we are not all that aware of how we are thinking, and not everyone uses the capacity for consciousness equally (Chiabetta, 1976; Csikszentmihalyi, 1993; Whimbey, Whimbey, & Shaw, 1975; Whimbey, 1980). The most likely reason is that all of us do not take the time to reflect on our experiences. Students often do not take the time to wonder why they are doing what they are doing. They seldom question themselves about their own learning strategies or evaluate the efficiency of their own performance. Some children virtually have no idea of what they should do when they confront a problem, and often they are unable to explain their decision-making strategies (Sternberg & Wagner, 1982). When teachers ask, "How did you solve that problem? What strategies did you have in mind?" or "Tell us what went on in your head to come up with that conclusion," students often respond, "I don't know. I just did it."

We want students to perform well on complex cognitive tasks. A simple example might be drawn from a reading task. While reading a passage, we sometimes find that our minds wander from the pages. We see the words, but no meaning is being produced. Suddenly, we realize that we are not concentrating and that we've lost contact with the meaning of the text. We recover by returning to the passage to find our place, matching it with the last thought we can remember, and once having found it, reading on with connectedness. This inner awareness and the strategy of recovery are components of metacognition.

Striving for Accuracy

Whether we are looking at the stamina, grace, and elegance of a ballerina or a carpenter, we see a desire for craftsmanship, mastery, flawlessness, and economy of energy to produce exceptional results. People who value truthfulness, accuracy, precision, and craftsmanship take time to check over their products. They review the rules by which they are to abide, they review the models and visions they are to follow, and they review the criteria they are to use to confirm that their finished product matches the criteria exactly. To be craftsmanlike means knowing that one can continually perfect one's craft by working to attain the highest possible standards and by pursuing ongoing learning to bring a laserlike focus of energies to accomplishing a task.

These people take pride in their work, and they desire accuracy as they take time to check over their work. Craftsmanship includes exactness, precision, accuracy, correctness, faithfulness, and fidelity. For some people, craftsmanship requires continuous reworking. Mario Cuomo, a great speechwriter and politician, once said that his speeches were never done; it was only a deadline that made him stop working on them.

Some students may turn in sloppy, incomplete, or uncorrected work. They are more eager to get rid of the assignment than to check it over for accuracy and precision. They are willing to settle for minimum effort rather than invest their maximum. They may be more interested in expedience rather than excellence.

Questioning and Posing Problems

One of the distinguishing characteristics of humans is our inclination and ability to *find* problems to solve. Effective problem solvers know how to ask questions to fill in the gaps between what they know and what they don't know. Effective questioners are inclined to ask a range of questions:

- What evidence do you have?
- How do you know that's true?
- How reliable is this data source?

They also pose questions about alternative points of view:

- From whose viewpoint are we seeing, reading, or hearing?
- From what angle, what perspective, are we viewing this situation?

Effective questioners pose questions that make causal connections and relationships:

- How are these (people, events, or situations) related to each other?
- What produced this connection?

Sometimes they pose hypothetical problems characterized by "if" questions:

- What do you think would happen *if* … ?
- *If* that is true, then what might happen *if* … ?

Inquirers recognize discrepancies and phenomena in their environment, and they probe into their causes:

- Why do cats purr?
- How high can birds fly?
- Why does the hair on my head grow so fast, while the hair on my arms and legs grows so slowly?
- What would happen if we put the saltwater fish in a freshwater aquarium?
- What are some alternative solutions to international conflicts, other than wars?

Some students may be unaware of the functions, classes, syntax, or intentions in questions. They may not realize that questions vary in complexity, structure, and purpose. They may pose simple questions intending to derive maximal results. When confronted with a discrepancy, they may lack an overall strategy to search for and find a solution.

Applying Past Knowledge to New Situations

Intelligent humans learn from experience. When confronted with a new and perplexing problem, they will draw forth experiences from their past. They often can be heard to say, "This reminds me of …" or "This is just like the time when I …" They explain what they are doing now with analogies about or references to their experiences. They call upon their store of knowledge and experience as sources of data to support, theories to explain, or processes to solve each new challenge. They are able to abstract meaning from one experience, carry it forth, and apply it in a novel situation.

Too often, students begin each new task as if it were being approached for the first time. Teachers are dismayed when they invite students to recall how they solved a similar problem previously—and students don't remember. It's as if they had never heard of it before, even though they recently worked with the same type of problem! It seems each experience is encapsulated and has no relationship to what has come before or what comes after. Their thinking is what psychologists refer to as an "episodic grasp of reality" (Feuerstein et al., 1980); that is, each event in life is separate and discrete, with no connections to what may have come before or no relation to what follows. Their learning is so encapsulated that they seem unable to draw it forth from one event and apply it in another context.

Thinking and Communicating with Clarity and Precision

Language refinement plays a critical role in enhancing a person's cognitive maps and ability to think critically, which is the knowledge base for efficacious action. Enriching the complexity and specificity of language simultaneously produces effective thinking.

Language and thinking are closely entwined; like either side of a coin, they are inseparable. Fuzzy, vague language is a reflection of fuzzy, vague thinking. Intelligent people strive to communicate accurately in both written and oral form, taking care to use precise language; defining terms; and using correct names, labels, and analogies. They strive to avoid overgeneralizations, deletions, and distortions. Instead, they support their statements with explanations, comparisons, quantification, and evidence.

We sometimes hear students and adults using vague and imprecise language. They describe objects or events with words like *weird, nice*, or *OK*. They name specific objects using such nondescriptive words as *stuff, junk, things*, and *whatever*. They punctuate sentences with meaningless interjections like *ya know, er*, and *uh*. They use vague or general nouns and pronouns: "*They* told me to do it," "*Everybody* has one," or "*Teachers* don't understand me." They use nonspecific verbs: "Let's *do* it." At other times, they use unqualified comparatives: "This soda is *better*; I like it *more*" (Shachtman, 1995).

Thinking Interdependently

Humans are social beings. We congregate in groups, find it therapeutic to be listened to, draw energy from one another, and seek reciprocity. In groups we contribute our time and energy to tasks that we would quickly tire of when working alone. In fact, solitary confinement is one of the cruelest forms of punishment that can be inflicted on an individual.

Collaborative humans realize that all of us together are more powerful, intellectually or physically, than any one individual. Probably the foremost disposition in our global society is the heightened ability to think in concert with others, to find ourselves increasingly more interdependent and sensitive to the needs of others. Problem solving has become so complex that no one person can go it alone. No one has access to all the data needed to make critical decisions; no one person can consider as many alternatives as several people.

Some students may not have learned to work in groups; they have underdeveloped social skills. They feel isolated, and they prefer solitude. They say things like "Leave me alone—I'll do it by myself," "They just don't like me," or "I want to be alone." Some students seem unable to contribute to group work and are job hogs; conversely, other students let all the others in a group do all the work. Working in groups requires the ability to justify ideas and to test the feasibility of solution strategies on others. It also requires developing a willingness and an openness to accept feedback from a critical friend. Through this interaction, the group and the individual continue to grow. Listening, consensus seeking, giving up an idea to work with someone else's, empathy, compassion, group leadership, knowing how to support group efforts, altruism—all are behaviors indicative of cooperative human beings.

Remaining Open to Continuous Learning

In a world that moves at warp speed, there is more to know today than ever before, and the challenge of knowing more and more in every succeeding day, week, month, and year ahead will only continue to expand exponentially. The quest for meaningful knowledge is critical and never ending.
Intelligent people are in a continuous learning mode. They are invigorated by the quest of lifelong learning. Their confidence, in combination with their inquisitiveness, allows them to constantly search for new and better ways. People with this Habit of Mind are always striving for improvement, growing, learning, and modifying and improving themselves. They seize problems, situations, tensions, conflicts, and circumstances as valuable opportunities to learn (Bateson, 2004).

A great mystery about humans is that many times we confront learning opportunities with fear rather than mystery and wonder. We seem to feel better when we know rather than when we learn. We defend our biases, beliefs, and storehouses of knowledge rather than invite the unknown, the creative, and the inspirational. Being certain and closed gives us comfort, whereas being doubtful and open gives us fear. As G. K. Chesterton so aptly expressed, "There is no such thing on earth as an uninteresting subject; there are only uninterested people."

Because of a curriculum employing fragmentation, competition, and reactiveness, students from an early age are trained to believe that deep learning means figuring out the truth rather than developing capabilities for effective and thoughtful action. They have been taught to value certainty rather than doubt, to give answers rather than to inquire, to know which choice is correct rather than to explore alternatives. Unfortunately, some adults are content with what they already believe and know. Their childlike curiosity has died. They exhibit little humility because they believe they are all knowing. They do not seek out or discover the wisdom of others. They do not know how or when to leverage a love of and lust for learning. As a result, they follow a path of little value and minimal opportunity.
Our wish is for creative students and people who are eager to learn. This Habit of Mind includes the humility of knowing that we don't know, which is the highest form of thinking we will ever learn. Paradoxically, unless we start off with humility, we will never get anywhere. As the first step, we must already have what eventually will be the crowning glory of all learning: to know—and to admit—that we don't know and to not be afraid to find out.