

DESCRIBING 16 HABITS OF MIND

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By definition, a problem is any stimulus, question, task, phenomenon, or discrepancy, the explanation for which is not immediately known. Thus, we are interested in focusing on student performance under those challenging conditions that demand strategic reasoning, insightfulness, perseverance, creativity, and craftsmanship to resolve a complex problem. Not only are we interested in how many answers students know, but also in knowing how to behave when they DON'T know. Habits of Mind are performed in response to those questions and problems the answers to which are NOT immediately known. We are interested in observing how students produce knowledge rather than how they merely reproduce knowledge. The critical attribute of intelligent human beings is not only having information, but also knowing how to act on it.

A "Habit of Mind" means having a disposition toward behaving intelligently when confronted with problems, the answers to which are not immediately known. When humans experience dichotomies, are confused by dilemmas, or come face to face with uncertainties--our most effective actions require drawing forth certain patterns of intellectual behavior. When we draw upon these intellectual resources, the results that are produced through are more powerful, of higher quality and greater significance than if we fail to employ those patterns of intellectual behaviors.

Employing "Habits of Mind" requires a composite of many skills, attitudes cues, past experiences and proclivities. It means that we value one pattern of thinking over another and therefore it implies choice making about which pattern should be employed at this time. It includes sensitivity to the contextual cues in a situation which signal this as an appropriate time and circumstance in which the employment of this pattern would be useful. It requires a level of skillfulness to employ and carry through the behaviors effectively over time. It suggests that as a result of each experience in which these behaviors were employed, the effects of their use are reflected upon, evaluated, modified and carried forth to future applications

HABITS OF MIND ATTEND TO: .

• Value:	Choosing to employ a pattern of intellectual behaviors rather than other, less productive patterns.
• Inclination:	Feeling the tendency toward employing a pattern of intellectual behaviors.
• Sensitivity:	Perceiving opportunities for, and appropriateness of employing the pattern of behavior.
• Capability:	Possessing the basic skills and capacities to carry through with the behaviors.
• Commitment:	Constantly striving to reflect on and improve performance of the pattern of intellectual behavior.

DESCRIBING HABITS OF MIND

When we no longer know what to do we have come to our real work and when we no longer know which way to go we have begun our real journey. The mind that is not baffled is not employed. The impeded stream is the one that sings.

Wendell Berry

What behaviors are indicative of the efficient, effective problem solver? Just what do human beings do when they behave intelligently? Research in effective thinking and intelligent behavior by Feuerstein (1980), Glatthorn and Baron (1985), Sternberg (1985), Perkins (1985), and Ennis (1985) indicates that there are some identifiable characteristics of effective thinkers. These are not necessarily scientists, artists, mathematicians or the wealthy who demonstrate these behaviors. These characteristics have been identified in successful mechanics, teachers, entrepreneurs, salespeople, and parents—people in all walks of life.

Following are descriptions and an elaboration of 16 attributes of what human beings do when they behave intelligently. We choose to refer to them as Habits of Mind. They are the characteristics of what intelligent people do when they are confronted with problems, the resolution to which are not immediately apparent.

These behaviors are seldom performed in isolation. Rather, clusters of such behaviors are drawn forth and employed in various situations. When listening intently, for example, one employs flexibility, metacognition, precise language and perhaps questioning.

Please do not think that there are only sixteen ways in which humans display their intelligence. It should be understood that this list is not meant to be complete. It should serve to initiate the collection of additional attributes. Although 16 Habits of Mind are described here, you, your colleagues and your students will want to continue the search for additional Habits of Mind by adding to and elaborating on this list and the descriptions.

1. Persisting

Persistence is the twin sister of excellence.
One is a matter of quality; the other, a matter of time.

Marabel Morgan,
The Electric Woman



Efficacious people stick to a task until it is completed. They don't give up easily. They are able to analyze a problem, to develop a system, structure, or strategy to attack a problem. They employ a range and have repertoire of alternative strategies for problem solving. 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 idea must be rejected and another employed. They have systematic methods of analyzing a problem which include knowing how to begin, knowing what steps must be performed, and what data need to be generated or collected. Because they are able to sustain a problem solving process over time, they are comfortable with ambiguous situations.

Students often give up in despair when the answer to a problem is not immediately known. They sometimes crumple their papers and throw them away saying, "I can't do this," "It's too hard," or, they write down any answer to get the task over with as quickly as possible. Some have attention deficits; they have difficulty staying focused for any length of time, they are easily distracted, they lack the ability to analyze a problem, to develop a system, structure, or strategy of problem attack. They may give up because they have a limited repertoire of problem solving strategies. If their strategy doesn't work, they give up because they have no alternatives.

2. Managing Impulsivity

"...goal directed self-imposed delay of gratification is perhaps the essence of emotional self-regulation: the ability to deny impulse in the service of a goal, whether it be building a business, solving an algebraic equation, or pursuing the Stanley cup.

Daniel Goleman *Emotional Intelligence* (1995) p. 83



Effective problem solvers have a sense of deliberativeness: They think before they act. They intentionally form a vision of a product, plan of action, goal or a destination before they begin. They strive to clarify and understand directions, develop a strategy for approaching a problem and withhold immediate value judgments about an idea before fully understanding it. Reflective individuals consider alternatives and consequences of several possible directions prior to taking 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 the first answer that comes to mind. Sometimes they shout out 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 fully understanding it. They may take the first suggestion given or operate on the first idea that comes to mind rather than considering alternatives and consequences of several possible directions.

3. Listening To Others—With Understanding and Empathy

Listening is the beginning of understanding....
Wisdom is the reward for a lifetime of listening.
Let the wise listen and add to their learning and let the discerning get guidance –

Proverbs 1:5



Highly effective people spend an inordinate amount of time and energy listening (Covey, 1989). Some psychologists believe that the ability to listen to another person, to empathize with, and to understand their point of view is one of the highest forms of intelligent behavior. Being able to paraphrase another person's ideas, detecting indicators (cues) of their feelings or emotional states in their oral and body language (empathy), accurately expressing another person's concepts, emotions and problems—all are indications of listening behavior (Piaget called it "overcoming ego-centrism"). They are able to see through the diverse perspectives of others. They gently attend to another person demonstrating their understanding of and empathy for an idea or feeling by paraphrasing it accurately, building upon it, clarifying it, or giving an example of it.

Senge and his colleagues (1994) suggest that to listen fully means to pay close attention to what is being said beneath the words. You listen not only to the "music", but also to the essence of the person speaking. You listen not only for what someone knows, but also for what he or she is trying to represent. Ears operate at the speed of sound, which is far slower than the speed of light the eyes take in. Generative listening is the art of developing deeper silences in yourself, so you can slow your mind's hearing to your ears' natural speed, and hear beneath the words to their meaning.

We spend 55 percent of our lives listening yet it is one of the least taught skills in schools. We often say we are listening but in actuality, we are rehearsing in our head what we are going to say next when our partner is finished. Some students ridicule, laugh at, or put down other students' ideas. They interrupt are

unable to build upon, consider the merits of, or operate on another person's ideas. We want our students to learn to devote their mental energies to another person and invest themselves in their partner's ideas.

We wish students to learn to hold in abeyance their own values, judgments, opinions, and prejudices in order to listen to and entertain another person's thoughts. This is a very complex skill requiring the ability to monitor one's own thoughts while, at the same time, attending to the partner's words. This does not mean that we can't disagree with some one. A good listener tries to understand what the other person is saying. In the end he may disagree sharply, but because he disagrees, he wants to know exactly what it is he is disagreeing with.

4. Thinking Flexibly

If you never change your mind, why have one?

Edward deBono



An amazing discovery about the human brain is its plasticity--its ability to "rewire", change and even repair itself to become smarter. Flexible people are the ones with the most control. They have the capacity to change their mind as they receive additional data. They engage in multiple and simultaneous outcomes and activities, draw upon a repertoire of problem solving strategies and can practice style flexibility, knowing when it is appropriate to be broad and global in their thinking and when a situation requires detailed precision.

They create and seek novel approaches and have a well-developed sense of humor. They envision a range of consequences.

Flexible people can approach a problem from a new angle using a novel approach {deBono (1970) refers to this as *lateral thinking*.} They consider alternative points of view or deal with several sources of information simultaneously. Their minds are open to change based on additional information and data or reasoning, which contradicts their beliefs. Flexible people know that they have and can develop options and alternatives to consider. They understand mean-ends relationships being able to work within rules, criteria and regulations and they can predict the consequences of flouting them. They understand not only the immediate reactions but are also able to perceive the bigger purposes that such constraints serve. Thus, flexibility of mind is essential for working with social diversity, enabling an individual to recognize the wholeness and distinctness of other people's ways of experiencing and making meaning.

Flexible thinkers are able to shift, at will, through multiple perceptual positions. One perceptual orientation is what Jean Piaget called, *egocentrism*--perceiving from our own point of view. By contrast, *allocentrism* is the position in which we perceive through another persons' orientation. We operate from this second position when we empathize with other's feelings, predict how others are thinking, and anticipate potential misunderstandings.

Another perceptual position is "macro-centric". It is similar to looking down from a balcony at ourselves and our interactions with others. This bird's-eye view is useful for discerning themes and patterns from assortments of information. It is intuitive, holistic and conceptual. Since we often need to solve problems with incomplete information, we need the capacity to perceive general patterns and jump across gaps of incomplete knowledge or when some of the pieces are missing.

Yet another perceptual orientation is micro-centric--examining the individual and sometimes minute parts that make up the whole. This "worm's-eye view", without which science, technology, and any complex enterprise could not function, involves logical analytical computation searching for causality in methodical steps. It requires attention to detail, precision, and orderly progressions.

Flexible thinkers display confidence in their intuition. They tolerate confusion and ambiguity up to a point, and are willing to let go of a problem trusting their subconscious to continue creative and productive work on it. Flexibility is the cradle of humor, creativity and repertoire. While there are many possible perceptual positions--past, present, future, egocentric, allocentric, macro centric, visual, auditory, kinesthetic--the flexible mind is activated by knowing when to shift perceptual positions.

Some students have difficulty in considering alternative points of view or dealing with more than one classification system simultaneously. THEIR way to solve a problem seems to be the ONLY way. They perceive situations from a very ego-centered point of view: "My way or the highway!" Their mind is made up; "Don't confuse me with facts, that's it."

5. Thinking About our Thinking (Metacognition)

When the mind is thinking it is talking to itself

Plato



Occurring in the neocortex, metacognition is our ability to know what we know and what we don't know. It is our ability to plan a strategy for producing what information 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. While "inner language," thought to be a prerequisite, begins in most children around age five, metacognition is a key attribute of formal thought flowering about age eleven.

Probably the major components of metacognition are developing a plan of action, maintaining that plan in mind over a period of time, then reflecting back on and evaluating the plan upon its completion. Planning a strategy before embarking on a course of action assists us in keeping 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 of this would be what superior teachers do daily: developing a teaching strategy for a lesson, keeping that strategy in mind throughout the instruction, then reflecting back 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 as one searches for information and meaning, developing mental maps or plans of action, mentally rehearsing prior to performance, monitoring those plans as they are employed--being conscious of the need for midcourse correction if the plan is not meeting expectations, reflecting on the plan upon completion of the implementation for the purpose of self-evaluation, and editing mental pictures for improved performance.

Interestingly, not all humans achieve the level of formal operations (Chiabetta, 1976). And as Alexander Luria, the Russian psychologist found, not all adults metacogitate (Whimbey, 1976). The most likely reason is that we do not take the time to reflect on our experiences. Students often do not take the time to wonder why we are doing what we 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 are often unable to explain their strategies of decision making (Sternberg and 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 by saying, "I don't know, I just did it."

We want our students to perform well on complex cognitive tasks. A simple example of this might be drawn from a reading task. It is a common experience while reading a passage to have 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.

6. Striving For Accuracy and Precision

A man who has committed a mistake and doesn't correct it
is committing another mistake.

Confucius



Embodied in the stamina, grace and elegance of a ballerina or a shoemaker, is the desire for craftsmanship, mastery, flawlessness and economy of energy to produce exceptional results. People who value 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 employ and confirm that their finish 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 pursue ongoing learning in order to bring a laser like focus of energies to task accomplishment. These people take pride in their work and have a desire for 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 anxious to get rid of the assignment than to check it over for accuracy and precision. They are willing to suffice with minimum effort rather than investing their maximum. They may be more interested in expedience rather than excellence.

7. Questioning and Posing Problems

The formulation of a problem is often more essential than its solution, which may be merely a matter of mathematical or experimental skill.

To raise new questions, new possibilities, to regard old problems from a new angle, requires creative imagination and marks real advances....

Albert Einstein



One of the distinguishing characteristics between humans and other forms of life 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. For example: requests for data to support others' conclusions and assumptions—such questions as,

"What evidence do you have.....?"

"How do you know that's true?"

"How reliable is this data source?"

They 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?"

Students pose questions, which make causal connections and relationships:

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

They pose hypothetical problems characterized by "iffy"-type 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 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 fresh water 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 of search and solution finding.

8. Applying Past Knowledge to New Situations

"I've never made a mistake. I've only learned from experience."

Thomas A. Edison



Intelligent human beings learn from experience. When confronted with a new and perplexing problem they will often draw forth experience from their past. They can often be heard to say, "This reminds me of...." or "This is just like the time when I..." They explain what they are doing now in terms of analogies with or references to previous 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. Furthermore, they are able to abstract meaning from one experience, carry it forth, and apply it in a new and novel situation.

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

9. Thinking and Communicating with Clarity and Precision

I do not so easily think in words.... after being hard at work having arrived at results that are perfectly clear... I have to translate my thoughts in a language that does not run evenly with them.

Francis Galton, Geneticist.



Language refinement plays a critical role in enhancing a person's cognitive maps, and their 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. When you hear fuzzy language, it is a reflection of fuzzy thinking. Intelligent people strive to communicate accurately in both written and oral form taking care to use precise language, defining terms, using correct names and universal 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 other adults using vague and imprecise language. They describe objects or events with words like *weird*, *nice*, or *OK*. They call specific objects using such non-descriptive words as *stuff*, *junk* and *things*. 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." "*Teachers* don't understand me. They use non-specific verbs: "Let's *do* it." and unqualified comparatives: "This soda is *better*; I like it *more*".

10. Gathering Data through All Senses

Observe perpetually.

Henry James



The brain is the ultimate reductionist. It reduces the world to its elementary parts: photons of light, molecules of smell, sound waves, vibrations of touch--which send electrochemical signals to individual brain cells that store information about lines, movements, colors, smells and other sensory inputs.

Intelligent people know that all information gets into the brain through the sensory pathways: gustatory, olfactory, tactile, kinesthetic, auditory, visual, Most linguistic, cultural, and physical learning is derived from the environment by observing or taking in through the senses. To know a wine it must be drunk; to know a role it must be acted; to know a game it must be played; to know a dance it must be moved; to know a goal it must be envisioned. Those whose sensory pathways are open, alert, and acute absorb more information from the environment than those whose pathways are withered, immune, and oblivious to sensory stimuli.

Furthermore, we are learning more about the impact of arts and music on improved mental functioning. Forming mental images is important in mathematics and engineering; listening to classical music seems to improve spatial reasoning.

Social scientists solve problems through scenarios and role-playing; scientists build models; engineers use cad-cam; mechanics learn through hands-on experimentation; artists experiment with colors and textures. Musicians experiment by producing combinations of instrumental and vocal music.

Some students, however, go through school and life oblivious to the textures, rhythms, patterns sounds and colors around them. Sometimes children are afraid to touch, get their hands "dirty" or feel some object might be "slimy" or "icky". They operate within a narrow range of sensory problem solving strategies wanting only to "describe it but not illustrate or act it", or "listen but not participate".

11. Creating, Imagining, and Innovating

"The future is not some place we are going to but one we are creating. The paths are not to be found, but made, and the activity of making them changes both the maker and the destination."

John Schaar, Political Scientist,
University of Santa Clara
Author, *Loyalty in America*



All human beings have the capacity to generate novel, original, clever or ingenious products, solutions, and techniques—if that capacity is developed. Creative human beings try to conceive problem solutions differently, examining alternative possibilities from many angles. They tend to project themselves into different roles using analogies, starting with a vision and working backward, imagining they are the objects being considered. Creative people take risks and frequently push the boundaries of their perceived limits (Perkins 1985). They are intrinsically rather than extrinsically motivated, working on the task because of the aesthetic challenge rather than the material rewards. Creative people are open to criticism. They hold up their products for others to judge and seek feedback in an ever-increasing effort to refine their technique. They are uneasy with the status quo. They constantly strive for greater fluency, elaboration, novelty, parsimony, simplicity, craftsmanship, perfection, beauty, harmony, and balance.

Students, however, are often heard saying, "I can't draw," "I was never very good at art," "I can't sing a note," "I'm not creative". Some people believe creative humans are just born that way; in their genes and chromosomes.

12. Responding with Wonderment and Awe

The most beautiful experience in the world is the experience of the mysterious."

Albert Einstein.



Describing the 200 best and brightest of the All USA College Academic Team identified by USA Today, Tracey Wong Briggs (1999) states, "They are creative thinkers who have a passion for what they do." Efficacious people have not only an "I CAN" attitude, but also an "I ENJOY" feeling. They seek problems to solve for themselves and to submit to others. They delight in making up problems to solve on their own and request enigmas from others. They enjoy figuring things out by themselves, and continue to learn throughout their lifetimes.

Some children and adults avoid problems and are "turned off" to learning. They make such comments as, "I was never good at these brain teasers," or "Go ask your father; he's the brain in this family. "Its boring." "When am I ever going to use this stuff?" "Who cares?" "Lighten up, teacher, thinking is hard work," or "I don't do thinking!" Many people never enrolled in another math class or other "hard" academic subjects after they didn't have to in high school or college. Many people perceive thinking as hard work and therefore recoil from situations, which demand "too much" of it.

We want our students, however to be curious; to commune with the world around them; to reflect on the changing formations of a cloud; feel charmed by the opening of a bud; sense the logical simplicity of

mathematical order. Students can find beauty in a sunset, intrigue in the geometric of a spider web, and exhilaration at the iridescence of a hummingbird's wings. They see the congruity and intricacies in the derivation of a mathematical formula, recognize the orderliness and adroitness of a chemical change, and commune with the serenity of a distant constellation. We want them feel compelled, enthusiastic and passionate about learning, inquiring and mastering.

13. Taking Responsible Risks.

There has been a calculated risk in every stage of American development--the pioneers who were not afraid of the wilderness, businessmen who were not afraid of failure, dreamers who were not afraid of action.

Brooks Atkinson



Flexible people seem to have an almost uncontrollable urge to go beyond established limits. They are uneasy about comfort; they "live on the edge of their competence". They seem compelled to place themselves in situations where they do not know what the outcome will be. They accept confusion, uncertainty, and the higher risks of failure as part of the normal process and they learn to view setbacks as interesting, challenging and growth producing. However, they are not behaving impulsively. Their risks are educated. They draw on past knowledge, are thoughtful about consequences and have a well-trained sense of what is appropriate. They know that all risks are not worth taking!

Risk taking can be considered in two categories: those who see it as a venture and those who see it as adventure. The venture part of risk taking might be described by the venture capitalist. When a person is approached to take the risk of investing in a new business, she will look at the markets, see how well organized the ideas are, and study the economic projections. If she finally decides to take the risk, it is a well considered one.

The adventure part of risk taking might be described by the experiences from project adventure. In this situation, there is a spontaneity, a willingness to take a chance in the moment. Once again, a person will only take the chance if they know that there is either past history that suggests that what they are doing is not going to be life threatening or if they believe that there is enough support in the group to protect them from harm. Ultimately, the learning from such high-risk experiences is that people are far more able to take actions than they previously believed.

It is only through repeated experiences that risk taking becomes educated. It often is a cross between intuition, drawing on past knowledge and a sense of meeting new challenges.

Bobby Jindal, executive Director of the National Bipartisan Commission on the Future of Medicare states,

"The only way to succeed is to be brave enough to risk failure. " (Briggs, 1999 p 2A)

When someone holds back from taking risks, he is confronted constantly with missed opportunities. Some students seem reluctant to take risks. Some students hold back games, new learning, and new friendships because their fear of failure is far greater than their experience of venture or adventure. They are reinforced by the mental voice that says, "if you don't try it, you won't be wrong" or "if you try it and you are wrong, you will look stupid". The other voice that might say, "if you don't try it, you will never know" is trapped in fear and mistrust. They are more interested in knowing whether their answer is correct or not, rather than being challenged by the process of finding the answer. They are unable to sustain a process of problem solving and finding the answer over time, and therefore avoid ambiguous situations. They have a need for certainty rather than an inclination for doubt

We hope that students will learn how to take intellectual as well as physical risks. Students who are capable of being different, going against the grain of the common, thinking of new ideas and testing them with peers as well as teachers, are more likely to be successful in this age of innovation and uncertainty.

14. Finding Humor

Where do bees wait? At the buzz stop.

Andrew, Age six



Another unique attribute of human beings is our sense of humor. Laughter transcends all human beings. Its' positive effects on psychological functions include a drop in the pulse rate, the secretion of endorphins, an increased oxygen in the blood. It has been found to liberate creativity and provoke such higher level thinking skills as anticipation, finding novel relationships, visual imagery, and making analogies. People who engage in the mystery of humor have the ability to perceive situations from an original and often interesting vantagepoint. They tend to initiate humor more often, to place greater value on having a sense of humor, to appreciate and understand others' humor and to be verbally playful when interacting with others. Having a whimsical frame of mind, they thrive on finding incongruity and perceiving absurdities, ironies and satire; finding discontinuities and being able to laugh at situations and themselves. Some students find humor in all the "wrong places"--human differences, ineptitude, injurious behavior, vulgarity, violence and profanity. They laugh at others yet are unable to laugh at themselves.

We want our student to acquire the characteristic of creative problem solvers, they can distinguish between situations of human frailty and fallibility which are in need of compassion and those which are truly funny. (Dyer, 1997).

15. Thinking Interdependently

Take care of each other. Share your energies with the group. No one must feel alone, cut off, for that is when you do not make it.

Willie Unsoeld
Renowned Mountain Climber



Human beings 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, we have learned that one of the cruelest forms of punishment that can be inflicted on an individual is solitary confinement.

Cooperative humans realize that all of us together are more powerful, intellectually and/or physically, than any one individual. Probably the foremost disposition in the post industrial 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 can.

Some students may not have learned to work in groups; they have underdeveloped social skills. They feel isolated, they prefer their solitude. "Leave me alone--I'll do it by my self". " They just don't like me". "I want to be alone." Some students seem unable to contribute to group work either by being a "job hog" or conversely, letting others 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 the development of a willingness and openness to accept the 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.

16 Learning Continuously:

Insanity is continuing to do the same thing over and over and expecting different results.

Albert Einstein



Intelligent people are in a continuous learning mode. 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, always growing, always learning, always modifying and improving themselves. They seize problems, situations, tensions, conflicts and circumstances as valuable opportunities to learn.

A great mystery about humans is that 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 inviting the unknown, the creative and the inspirational. Being certain and closed gives us comfort while being doubtful and open gives us fear.

From an early age, employing a curriculum of fragmentation, competition and reactivity, students 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.

Our wish is for creative students and people who are eager to learn. That includes the humility of knowing that we don't know, which is the highest form of thinking we will ever learn. Paradoxically, unless you start off with humility you will never get anywhere, so as the first step you have to have already what will eventually be the crowning glory of all learning: the humility to know--and admit--that you don't know and not be afraid to find out.

IN SUMMARY

Drawn from research on human effectiveness, descriptions of remarkable performers, and analyses of the characteristics of efficacious people, we have presented descriptions of sixteen Habits of Mind. This list is not meant to be complete but rather to serve as a starting point for further elaboration and description.

These Habits of Mind may serve as mental disciplines. When confronted with problematic situations, students, parents and teachers might habitually employ one or more of these Habits of Mind by asking themselves, "What is the most *intelligent thing* I can do right now?"

- How can I learn from this, what are my resources, how can I draw on my past successes with problems like this, what do I already know about the problem, what resources do I have available or need to generate?
- How can I approach this problem *flexibly*? How might I look at the situation in another way, how can I draw upon my repertoire of problem solving strategies; how can I look at this problem from a fresh perspective (Lateral Thinking).
- How can I illuminate this problem to make it clearer, more precise? Do I need to check out my data sources? How might I break this problem down into its component parts and develop a strategy for understanding and accomplishing each step.

- What do I know or not know; what questions do I need to ask, what strategies are in my mind now, what am I aware of in terms of my own beliefs, values and goals with this problem. What feelings or emotions am I aware of which might be blocking or enhancing my progress?
- The interdependent thinker might turn to others for help. They might ask how this problem affects others; how can we solve it together and what can I learn from others that would help me become a better problem solver?

Taking a reflective stance in the midst of active problem solving is often difficult. For that reason, each of these Habits of Mind is situational and transitory. There is no such thing as perfect realization of any of them. They are utopian states toward which we constantly aspire. Csikszentmihalyi (1993, p. 23) states,

"Although every human brain is able to generate self-reflective consciousness, not everyone seems to use it equally."

Few people, notes Kegan (1994) ever fully reach the stage of cognitive complexity, and rarely before middle age.

These Habits of Mind transcend all subject matters commonly taught in school. They are characteristic of peak performers whether they be in homes, schools, athletic fields, organizations, the military, governments, churches or corporations. They are what make marriages successful, learning continual, workplaces productive and democracies enduring.

The goal of education therefore, should be to support others and ourselves in liberating, developing and habituating these Habits of Mind more fully. Taken together, they are a force directing us toward increasingly authentic, congruent, ethical behavior, the touchstones of integrity. They are the tools of disciplined choice making. They are the primary vehicles in the lifelong journey toward integration. They are the "right stuff" that makes human beings efficacious.

"We are what we repeatedly do. Excellence, then, is not an act but a habit."

Aristotle

REFERENCES

- Briggs, Tracey, W. Passion For What They Do Keeps Alumni On First Team. *U. S. A Today*. February 25, 1999. Vol. 17, No. 115 pp. 1A-2A.
- Chiabetta, E. L. A. Review Of Piagetian Studies Relevant To Science Instruction At The Secondary And College Levels. *Science Education*. 60. pp. 253-261.
- Costa, A. (1991) The Search For Intelligent Life. in A. Costa, (Ed.) *Developing Minds: A Resource Book for Teaching Thinking*: pp. 100-106 Alexandria, VA: Association for Supervision and Curriculum Development.
- Csikszentmihalyi, M. (1993). *The Evolving Self: A Psychology for the Third Millennium*. New York, NY: Harper Collins Publishers, Inc.
- Covey, S. (1989) *The Seven Habits Of Highly Effective People*. New York: Simon and Schuster.
- DeBono, E. (1991) The Cort Thinking Program in A. Costa (Ed) *Developing Minds: Programs for Teaching Thinking*. Alexandria, VA pp. 27-32: Association for Supervision and Curriculum Development.
- Dyer, J. (1997) Humor As Process in A. Costa, A and R. Liebmann, (Eds.) *Envisioning Process as Content: Toward a Renaissance Curriculum* pp. 211-229 Thousand Oaks, CA: Corwin Press.
- Ennis, R. (1985). Goals For A Critical Thinking Curriculum. In A. L. Costa (Ed.), *Developing Minds: A Resource Book for Teaching Thinking*. Alexandria, VA: Association for Supervision and Curriculum Development, 1985.
- Feuerstein, R. Rand, Y.m, Hoffman, M. B., & Miller, R. (1980). *Instrumental Enrichment: An Intervention Program For Cognitive Modifiability*. Baltimore: University Park Press.

- Glatthorn, A. & Baron, J. (1985). The Good Thinker. In A. L. Costa (Ed.), *Developing Minds: A Resource Book for Teaching Thinking*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Goleman, D. (1995) *Emotional Intelligence: Why It Can Matter More Than I. Q.* New York: Bantam Books.
- Kegan, R. (1994) In *Over Our Heads: The Mental Complexity Of Modern Life*. Cambridge, Ma: Harvard University Press.
- Perkins, D. (1985). What Creative Thinking Is. In A. L. Costa (Ed.), *developing minds: A resource book for teaching thinking*. pp. 85-88 Alexandria, VA: Association for Supervision and Curriculum Development.
- Perkins, D. (1995) *Outsmarting I. Q.: The Emerging Science of Learnable Intelligence*. New York: The Free Press.
- Senge, P., Ross, R., Smith, B., Roberts, C., & Kleiner, A. (1994) *The Fifth Discipline Fieldbook: Strategies And Tools For Building A Learning Organization*. New York: Doubleday/Currency.
- Sternberg, R. and Wagner, R. Understanding Intelligence: What's In It For Education? Paper submitted to the National Commission on Excellence in Education.
- Sternberg, R. (1984). *Beyond I.Q.: A Triarchic Theory of Human Intelligence*. New York: Cambridge University Press.
- Sternberg, R. (1983) *How Can We Teach Intelligence?* Philadelphia, PA: Research for Better Schools
- Whimbey, A. and Whimbey L. S. (1975) *Intelligence Can Be Taught*. New York: Lawrence Erlbaum Associates

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Book I: Discovering and Exploring Habits of Mind

Book II: Activating and Engaging Habits of Mind

Book III: Assessing and Reporting Growth in Habits of Mind

Book IV: Integrating and Sustaining Habits of Mind