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DESIGNING CURRICULUA WITH THINKING DISPOSITIONS IN MIND

Learning Guide

Description: Are we preparing students for a life of tests or for the tests of life?

While many cite the need for critical and creative thinking, collaboration, and communication, do we align our curriculum with those thinking dispositions? This institute will (1) define dispositions, (2) describe their place in the curriculum, and (3) offer ways to assess their growth over time. Designing a curriculum focused on dispositional thinking requires a different mindset. This institute will challenge and help re-frame your mental maps to focus on the real purposes of 21st century education

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WHAT ARE DISPOSITIONS?

We draw on the work of Ron Ritchhart (2002) from Harvard University and his definition of dispositions in his book, *Intellectual Character: What it is, why it Matters, and How to get it.* San Francisco: Jossey Bass

> " …acquired patterns of behavior that are under one's control and will as opposed to being automatically activated. Dispositions are overarching sets of behaviors, not just single specific behaviors. They are dynamic and idiosyncratic in their contextualized deployment rather than prescribed actions to be rigidly carried out. More than desire and will, dispositions must be coupled with the requisite ability. Dispositions motivate, activate, and direct our abilities."

UNPACKING RITCHHART'S DEFINITION

1. Acquired patterns of behavior that are under one's control and will as opposed to being automatically activated.

2. Overarching sets of behaviors, not just single specific behaviors.

3. Dynamic and idiosyncratic in their contextualized deployment rather than prescribed actions to be rigidly carried out.

4. More than desire and will, dispositions must be coupled with the requisite ability.

5. Dispositions motivate, activate, and direct our abilities.

COMPLETE THIS FORM INDIVIDUALLY.

WHAT IS IT ABOUT YOUR STUDENTS THAT MAKES YOU THINK THEY NEED TO LEARN HOW TO THINK: WHAT DO YOU HEAR THEM SAYING, SEE THEM DOING OR FEELING?	HOW WOULD YOU LIKE THEM TO BE?	HABITS OF MIND CROSS WALK: COMPARE YOUR LIST WITH HABITS OF MIND P. 20	NOTES

HABITS OF MIND
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> *Habit is a cable; we weave a thread of it each day, and at last we cannot break it.*
> Horace Mann, **American Educator** 1796-1859

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 they 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. 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 are more powerful, of higher quality and of greater significance than if we fail to employ those 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 alertness to the contextual cues that 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), Ennis, (1985) and Goleman (1995) 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*. These habits are seldom performed in isolation. Rather, clusters of such habits 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. 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

> Be like a postage stamp—stick to one thing until you get there.
> Margaret Carty

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 that 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 before fully understanding an idea. 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. They may take the first suggestion given or operate on the most obvious and simple idea that comes to mind rather than considering more complex 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 their 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 and 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 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 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, a new possibility, 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 of 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

> "The limits of my language are the limits of my mind. All I know is what I have words for."
> Ludwig Wittgenstein

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.

Many scientists say we actually have nine senses: External senses that are engaged from external sources include sight, sound, taste, touch, and smell. They provide information about the outside world. Pain, balance, thirst and hunger are considered to be our internal senses. They provide information about the body and its needs. For example, the sense of hunger shows that the body needs food.

Intelligent people know that all information gets into the brain through these 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 do.

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". To insure powerful learning, we want students to experience the world through as many different avenues as possible.

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, 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; it's 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 geometrics 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 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, Governor of Louisiana 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 an era of innovation and uncertainty.

14. Finding Humor

"People who laugh actually live longer than those who don't laugh. Few persons realize that health actually varies according to the amount of laughter." James J. Walsh

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 original and often interesting vantage points. 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 students to acquire the characteristic of creative problem solvers, they can distinguish between situations of human frailty and fallibility that are in need of compassion and those that 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
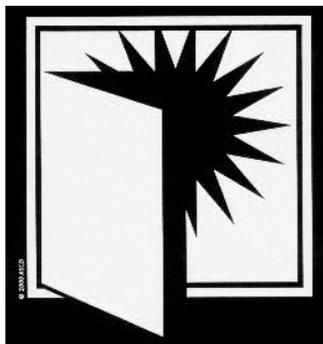
> Insanity is continuing to do the same thing over and over and expecting different results.
> Albert Einstein

to

Intelligent people are in a continuous learning mode. Their confidence, in combination with their inquisitiveness, allows them 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 reactiveness, 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 <u>fully</u> 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 are 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

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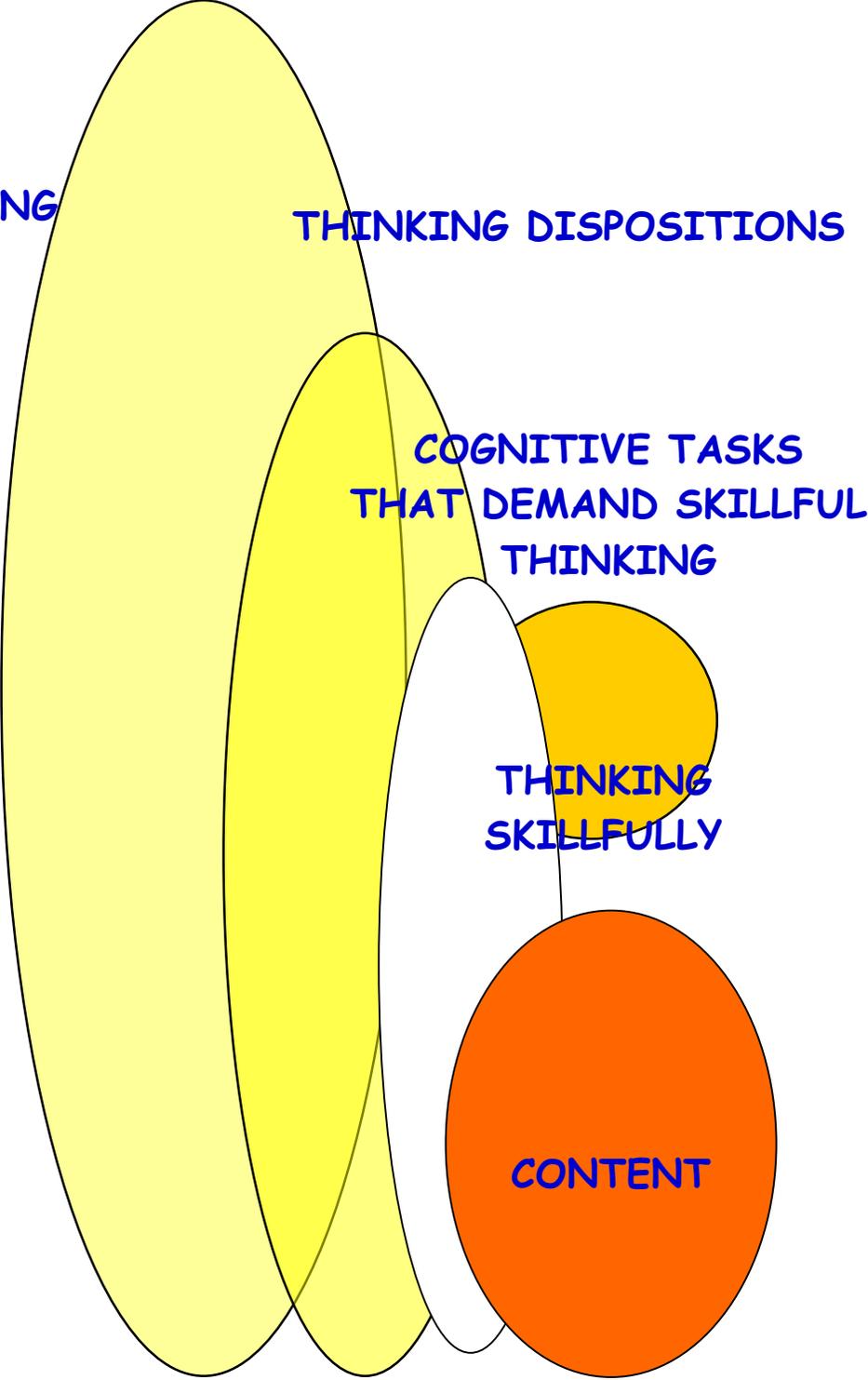Whimbey, A. and Whimbey L. S. (1975) *Intelligence Can Be Taught.* New York: Lawrence Erlbaum Associates.

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HABITS OF MIND

Habits of Mind are dispositions displayed by intelligent people in response to problems, dilemmas, and enigmas, the resolution of which are not immediately apparent.

1. Persisting: *Stick to it!* Persevering in task through to completion; remaining focused	**2. Managing impulsivity:** *Take your Time!* Thinking before acting; remaining calm thoughtful and deliberative.
3.Listening with understanding and empathy: Understand *Others*! Devoting mental energy to another person's thoughts and ideas; holding in abeyance one's own thoughts in order to perceive another's point of view and emotions	**4. Thinking flexibly:** *Look at it Another Way!* Being able to change perspectives, generate alternatives, consider options.
5. Thinking about your Thinking (Metacognition): *Know your knowing!* Being aware of one's own thoughts, strategies, feelings and actions and their effects on others.	**6. Striving for accuracy and precision:** *Check it again!* A desire for exactness, fidelity and craftsmanship.
7. Questioning and Problem Posing: How *do you know?* Having a questioning attitude; knowing what data are needed and developing questioning strategies to produce those data. Finding problems to solve.	**8. Applying past knowledge to new situations.** *Use what you Learn!* Accessing prior knowledge; transferring knowledge beyond the situation in which it was learned.
9. Thinking and Communicating with clarity and Precision: *Be clear!* Striving for accurate communication in both written and oral form; avoiding over generalizations, distortions and deletions	**10. Gathering Data Through all Senses:** *Use your natural pathways!* Gathering data through all the sensory pathways--gustatory, olfactory, tactile, kinesthetic, auditory and visual.
11. Creating, imagining, and innovating *Try a different way!* Generating new and novel ideas, fluency, originality	**12. Responding with Wonderment and awe:** *Have fun figuring it out!* Finding the world awesome, mysterious and being intrigued with phenomena and beauty.
13. Taking Responsible Risks: *Venture out!* Being adventuresome; living on the edge of one's competence	**14. Finding Humor:** Laugh *a little!* Finding the whimsical, incongruous and unexpected. Being able to laugh at oneself.
15. Thinking Interdependently: *Work together!* Being able to work in and learn from others in reciprocal situations.	**16. Remaining Open to Continuous Learning:** Learn *from experiences!* Having humility and pride when admitting we don't know; resisting complacency.

EFFECTIVE THINKING
REQUIREMENTS:

THINKING DISPOSITIONS

COGNITIVE TASKS
THAT DEMAND SKILLFUL
THINKING

THINKING
SKILLFULLY

CONTENT

HOW <u>AM I</u> DOING CHECKLIST

HABIT OF MIND: Listening with Understanding and Empathy	OFTEN	SOME- TIMES	NOT YET

HOW ARE WE DOING CHECKLIST

HABIT OF MIND	OFTEN	SOME TIMES	NOT YET

ASSESSING DISPOSITIONAL GROWTH

Possible Assessment Strategies	Page Ref. Learning Guide	We already use this strategy and could integrate dispositions	We are not using this and I would like to include it in our assessments	What I need to do to have it included	Digital Resources	Notes
Selected Response/ Questionaires	25					
Art work						
Portfolios	27					
Interviews	26					
Games	28					
Rubrics	30-31					
Checklists	29					
Exhibitions						
Obs, Products /performance	25					
Journals, Logs & Diaries	29					
Cutting Edge Technologies	32					
Other						

OBSERVING AND ASSESSING GROWTH IN DISPOSITIONAL LEARNING
By Arthur L. Costa and Bena Kallick
Excerpted from our book:
(2014) *Dispositions: Reframing Teaching and Learning:* Thousand Oaks, CA: Corwin Press

Using the method of selected response—designing choices that might tap into a student's awareness and feelings about the meaning and value of using particular habits given a problem or situation posed in the curriculum. For example, the student might be given the following sort of choice after a particular problem- solving assignment: On a scale from 1 to 10 (one being the lowest and 10 being the highest), how would you rate your ability to stay with the problem when it presented some difficulty for you? Explain your reasoning. Another example:

> "When I was working with this group I found that I was able to listen to the others in the group and work to understand their perspectives."
> "Not able to stay with the group as my mind wandered away from the task. "
> "Interrupting people because I got frustrated with the way the group was working."
> "Wishing that I could do this work alone."

Open-ended questionnaires—in which students express their awareness of the meaning and value of one of the habits. For example, "As you were working on this particular problem, which of the dispositions did you find you were calling on?" Or, "In this particular situation, you were confronted with a really complex problem in which you were asked to develop your opinion about potential solutions. What helped you to persist when you felt a struggle with the task?"

Observations of performances—what does it look like when a stu-dent applies a disposition? What will they be doing or saying? Asking students to self-observe, peer observe, and also have teachers observe to infer levels of internalization of dispositions during the process of working on a product or performance.

There are many ways that students can reveal their learning to others and to themselves. Many include using digital tools that allow a student to create a museum, video, film, play, website, etc. These performances should be accompanied by questions that require the student to reflect on their development of dispositions such as, "In what ways did the use of technology challenge your ability to think flexibly? As you considered which of the tools to use, what were some of your considerations? When you were working with the others in your group, what were some of the strategies that you used to stay on task?"
Every educator should become skillful in developing and observing students performance of these dispositions. Collecting data about students' persisting, for example, might include the following: persevering through disappointment and challenge in their problem solving, spending additional time, consulting others, reviewing and revising their decisions when hoped for results have not occurred?

- Look at problems from various perspectives and be open to the influence of other ideas.
- Insist on quality performance from themselves and their peers and accept nothing less.
- Reserve their conclusions until adequate data is collected. They will develop a planned strategy for attacking their problem, and they will monitor their progress and have alternatives if their plan is not working.
- Reflect on their learning in one project; synthesize and carry forth what they have learned to make applications to future projects.

We want to foster the metacognitive process through feedback from these observations. Metacognition is the humans' ability to reflect on how effectively they are handling the problem solving. When we observe students persisting with difficult tasks, over- coming frustration, setting and achieving goals, seeking help, working with others, and monitoring and adjusting to changing circumstances while accomplishing their specific goals—we are observing the metacognitive qualities (executive functions) that are vastly more important, transferrable, lasting, and essential than recalling how to factor a polynomial.

Interviews—holding conversations with students about their feelings, understanding, and internalization of the dispositions. For example, we might ask primary grade students questions such as the following:
- As you recall the dispositions we have discussed this year, which ones do you think you use most?
- Why do you think it's important to use these dispositions?
- What does it look like and sound like if someone is using persistence, creativity, empathy, or craftsmanship well?
- How might you describe learning these dispositions to new students, parents, or friends?
- What questions do you have about the dispositions?
-

We might ask secondary grade students questions such as the following:
- As you consider the dispositions we've learned this year, which are the ones that come to mind first for you?
- Describe one or two situations in which you are using one or more of the dispositions. How do you know which dispositions would be important to use in that situation?
- What observations have you made about yourself or others in light of the dispositions?
- When you have a problem in your class, in school, or at home, what do you say to yourself that reminds you to use the dispositions?
- In what ways might you encourage others to use the dispositions to support learning?
- Given what you know about yourself as a learner, which dispositions might you describe as your strengths and stretches? What are some reasons?
- What goals are you setting for yourself regarding the dispositions as you move on toward college or a career?

In any of these situations, it is not the assessment data in and of itself that is significant. Rather, it is the ability for students to use the feedback to learn about themselves and others. These assessment strategies will foster a metacognitive capacity to reflect on how effectively the students are handling themselves as learners.

Because we are all on a continuous journey of improvement of our dispositions, dispositional learning requires continuous ongoing formative assessments. Different students are at different stages in their development of these dispositions. For numerous reasons—emotional, familial, cultural, genetic, and so on—some students are more inclined to display manifestations of these dispositions than others. Presenting students with assessment data that is generated from assessments as described previously, teachers and parents will readily determine growth in the capacities and inclinations to develop their dispositions. The From—To chart describes a continuum of typical behaviors of students as they focus on developing their capacities for self-assessment and making a commitment for growth toward internalization of several of these dispositions. "Getting better" at a disposition means that they are increasingly improving in the eight dimensions that have been referenced earlier in this chapter.

FROM	TO	DISPOSITIONS
Gives up quickly. Gets frustrated but lacks strategies for knowing what to do when "stuck." Displays very short attention span.	Stays with a task, remains focused through to completion. Generates and employs multiple and various problem-solving strategies	Perseverance
Blurts out ideas. Jumps to conclusions. Begins work without clear goals in mind. Lashes out when emotionally flooded.	Is deliberative and goal directed. Thinks and considers alternatives before responding or acting. Reflects on actions and sets goals for improvement	Inhibition of Impulse
Ignores or interrupts others. Is unaware of other's feelings/emotions. Speaks mainly from an ego-centered point of view.	Paraphrases other's ideas. Responds with empathy, Clarifies to deepen meaning, Inquires into ideas of mutual interest. Builds on ideas of previous speakers.	Listening with understanding and empathy,
Is rigid in thinking unable to see other's point of view. Interprets from a narrow perspective. Refuses to change mind. Holds to one alternative. Views the world ego-centrically.	Is willing to change perceptions and conclusions with additional information. Considers other's points of view. Can examine issues both holistically and analytically. Appreciates and values others' culture, style and perspectives.	Flexibility and open mindedness
Follows instructions or performs tasks without wondering why they are doing what they are doing. Seldom questions themselves about their own learning strategies or evaluate the efficiency of their own performance. Has no idea of what to do when confronting a problem. Are often unable to explain their strategies of decision-making. Lacks names for commonly used cognitive processes.	Possesses a repertoire of problem solving strategies and approaches and can track and describe progress as they are implemented. Is conscious of own beliefs, values and actions and their effects on others. Can describe what goes on in their head when employing cognitive processes (comparing, predicting, concluding, hypothesizing, etc.)	Awareness of own thinking, (Metacognition)
Is satisfied with disorganized, incomplete, inaccurate and error-ridden work.	Takes pride in their accomplishments. Has a desire for accuracy as they employ various strategies to check over their work. Reviews the rules and criteria to guide their work and confirms that finished products match the criteria exactly. Knows that they can continually perfect one's craft.	Desire for craftsmanship, accuracy and precision

Portfolios

This is a digital age in which the collection of work is easier and more accessible than it has ever been in the past. Harvard University's Tony Wagner (2012, para. 12) states, "I believe the U.S. Department of Education and state education departments need to develop ways to assess essential skills with digital portfolios that follow students through school."

There are many Web 2.0 tools available for students to collect their work over time (For examples, http://msumeyers.weebly .com/student-website-examples.html) (See Farr, 2013). However, the idea of a portfolio is not to just collect the work. That might make an interesting scrapbook. Rather, it is to

showcase powerful examples of work in which the student can highlight not only the product but also the process. Such reflections might be prompted by the following:

Choose work that demonstrates your capacity to persist when you were struggling. What were some of the strategies that you employed to help you make your way toward accomplishing your goal?

Choose work that demonstrates your best use of a time management plan. What were some of the strategies that you used to help you to keep your project moving forward?

Choose work that demonstrates your taking a risk in your work. What did you need to do to have the courage to stay with your decisions realizing that you were innovating?

Choose work that demonstrates you thought creatively or that you generated a novel approach to solving a problem or that you generated a new and different twist on an idea. Figure 7.2 describes a process for developing a portfolio.
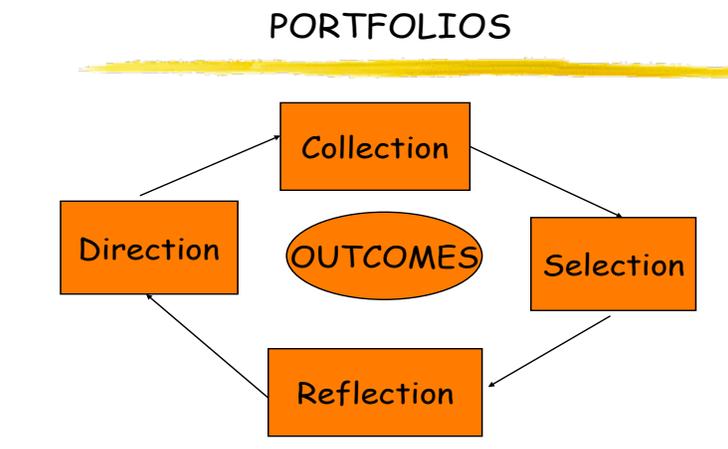
PORTFOLIOS

Phase 1: *Collection*—Students collect work that has some meaning for them. They put that work in a folder. Using technology, they can create a portfolio folder and then have subtitles such as: flexible thinking, using all of the senses, wonderment and awe, and craftsmanship. The teacher or the system can choose which dispositions will serve as evidence of the development of student the school is looking for.

Phase 2: *Selection*—On a quarterly basis (or otherwise depending on the school), there is a review of the collection. At that time, students select those works that they feel are best indicators of their working on the disposition. For example, the student might choose a particular piece of writing that shows communicating with clarity and precision. Or the student might choose a video film that shows how the student worked in a group and was able to work interdependently.

Phase 3: *Reflection*—The student, in each phase of this process, is developing a stronger sense of evaluation of work; it is this phase that really brings it together. The student is required to reflect on the choices made and justify the claim of how they were working on a disposition with the evidence in the working process or product.

Phase 4: *Direction*—The cycle is completed when the student takes all of the thinking and learning that has been provoked by the development of the portfolio and sets some goals for the next cycle. What do I feel really proud of? What do I think that I can improve on? What might be some benchmarks that would tell me that I am improving?

Games

Once again, technology has pushed the frontier of using gaming for learning. Games give students immediate feedback: They might fail but they know why they've failed—the game lets them know their mistakes up front. Students can then reflect on how they may need to make modifications in their game play to be even more successful next time.

Many games require students to apply and monitor the use of such dispositions as strategic thinking, problem solving, creativity, thinking interdependently, and using clear and precise communication. If students play a multiplayer contest and win, they demonstrate that they can collaborate and strategize in teams, and the game play is designed to assess these skills. Students can be alerted to or they can discover which dispositions they must monitor and then, as they are playing the game, observers might record which dispositions are apparent and give feedback is the game play is debriefed. Teachers may want to observe students playing the games and use such checklists (as those provided here) as observational tools (Miller, 2013).

Developing and Keeping Checklists
Invite students to describe how we can determine if they are becoming more aware of their thinking (metacognition). When asked, they can do the following:

- List the steps and tell where they are in the sequence of a problem solving strategy
- Trace the pathways and dead ends they took on the road to a problem solution
- Describe what data are lacking and their plans for producing those data
-

Or for persistence, they can do or answer the following:
- What would we see or hear a person doing if they are persisting?
- Stick to it when the solution to a problem is not immediately apparent
- Employ systematic methods of analyzing a problem
- Know ways to begin, know what steps must be performed, and know when they are
    accurate or are in error
- Take pride in their efforts
- Strive for craftsmanship and accuracy in their products
- Become more self-directed in their problem-solving abilities
- Celebrate their achievements
- Tap into other resources (human, electronic, textual) for ideas, suggestions, and advice

Checklists are developed through conversations in the class- room. Students are asked, "What would it look like if a person were a good listener? What would it sound like if a person were a good listener?" Students generate a list of positively constructed observable behaviors. For example, in the "looks like" category, there might be responses such as, "establishes eye contact" or "nods head when agreeing." In the" sounds like" category, there might be responses such as, "builds on the other person's ideas" or "clarifies when does not understand."

The teacher then assigns or students choose a task or problem on which to work interdependently. The teacher gives directions that each student should monitor their own participation while engaging with the group to solve the problem. The students and the teacher agree to observe themselves for these behaviors.

Notice that this checklist is entitled, "How am I Doing.'' A variation of this activity is to change the title of the checklist to "How Are We Doing?" The teacher invites two or three students per group (depending on the size of the group) to observe and record each group member's flexibility behavior during the task. Afterward, the teacher invites the group to reflect on their flexibility behaviors. The observer students then share the data they collected with the rest of the group. No doubt there will be dissentions and disagreements among the observers and the group members, which will provide rich learning opportunities for members of the group to listen with understanding and empathy, to communicate with precision, to metacogitate, and to manage their understanding and empathy.

Journals, Logs, and Diaries

Consciousness about the dispositions often begins with journal entries designed to help students focus on how they are developing. Learning logs, journals, and diaries are ways to collect evidence over time about students' self-assessment of their use of and feelings about the dispositions. They are especially powerful in engaging meta- cognition and helping students draw forth previous knowledge.

Before, or directly following, a unit, project, or area of study, invite students to make entries in their logs or journals. Short, frequent bursts of writing are sometimes more productive than infrequent, longer assignments. Teachers, too, can join in the writing process by reflecting on their teaching, analyzing learners' learn- ing, preserving anecdotes about the class interactions, and projecting ideas for how they might approach a unit of study differently in the future.

Consider these dispositional sentence starters to help students document their learning:
One thing that surprised me today was . . .
I felt particularly flexible when I . . .
I used my senses to...
As I think about how I went about solving the problem, I . . .
A question I want to pursue is...
When I checked my work I found...
Because I listened carefully I learned . . .

Students can collect specific log entries from time to time, read through them, and share written comments with the teacher and peers if they are so inclined. This practice helps build stronger relationships with the learners and provides a useful way for them to assess how well they are doing and how their conscious use of the habits of mind is developing. Initial journal entries can be compared with more recent or final ones so that students can reflect on and assess their growth over time. They can then respond to the prompt: "I used to think _____ but now I think _____."

Rubrics

Involving students in developing and applying rubrics is another way to for them to assess their performance of dispositions. The purpose of rubrics is for self-mastery. Through student's self-authoring of descriptions and indicators of what they will be doing and saying if they are using the disposition effectively, rubrics pro- mote self-managing, self-monitoring, and self-evaluating. They pro- vide a mental rehearsal prior to performance. The intent is for students to describe the categories of behaviors, hold them in their head as they apply them, and then evaluate their performance and make plans for improvement . Each category should be sufficiently clear so students can learn from the feedback about their behavior and to seek ways to improve. Following are two examples of rubrics developed by upper-grade students from Kittredge School in San Francisco under the direction of their men- tor, Chuck Lavaroni. Notice that the statements begin with "I" or that they are about "me." Several statements also invite students to describe their feelings as well as their performances.

RUBRIC FOR METACOGNITION

DESCRIBING

5. I am very proud that I can and do describe what I am doing as I solve a problem, develop a new solution or work on any thinking activity.
4. I enjoy describing the thinking I do as I solve a problem or develop some new answer, story or solution
3. I find it difficult to describe the thinking I am doing during the time I am working on a project, solution or new answer.
2. Describing what I am doing as I am thinking about what I am learning is almost impossible for me.
1. I get angry when people ask me what I am doing as I think; in fact I refuse to think about what I am thinking while working on my learning.

PLANNING

5. I recognize how important it is to make a thinking plan or strategy before I solve a problem answer a question or create a new product.
4. I often try to develop a strategy as to what I must do to answer a question, solve a problem or explain something new.
3. I often need help to get a strategy ready to use before I can begin a new thinking task.
2. Even with help I find planning a thinking strategy very difficult.
1. I don't see how anyone can develop a plan or strategy for thinking you either know it or you don't

MONITORING

5. I love my ability to be able to think about or monitor my thinking as I am learning.
4. I find I do better on those occasions when I think about my learning strategy as I am learning.
3. I sometimes think about or monitor my thinking as I am involved in the work I am doing.
2. I find monitoring my thinking as I am thinking very difficult for me.
1. There is no way I can ever think about monitoring my thinking,

REFLECTING

5. Thinking about or reflecting on my thinking is one of the most important skills I use because that is how I better learn how to solve a problem, or develop a new solution, idea or product.
4. When I reflect upon my thinking I often get ideas that help me develop and use strategies on new issues.
3. Reflecting on my thinking is difficult but having someone help me do that makes it very interesting.
2. I find it very hard to reflect on my thinking while working, before working or even after working on a thinking task.
1. Reflecting about my thinking is impossible and a waste of time.

Using the Power of Technology and Social Networks
As existing knowledge becomes increasingly more accessible through the available technologies, there needs to be a shift toward paying more attention to the construction of meaning. We now realize that the input of factual information at Bloom's taxonomical (1984) levels of knowledge and comprehension

 (For an additional set of dispositionally related rubrics developed by the American Association for College and Universities (AACU), please visit value@aacu.org.)

are accessed more and more through technologies and less and less from textbooks and lectures. However, giving the new knowledge meaning requires building the dispositions so that students are giving meaning by asking questions such as the following:

- How do I know whether this is a credible source?
- Whose perspective is represented here? Is there another perspective I should be pursuing?
- How does my interaction with my peers influence the way I am thinking?
- Where have I learned something about this before and how does that help me to understand the meaning of this work?
- Is it possible for me to create a graphic representation of this work to enhance its meaning?

Questions such as these lead students to dig more deeply into the learning. And can lead to assessment tasks that push the students to take their insights to another level and construct new knowledge through performances such as writing a play, creating a film, or building a robot. Uses of technologies offer endless possibilities for high-level performances.
Social networks increase the possibility of students sharing their work with others around the world and opens opportunities for feedback. The use of online protocols (McDonald, Zydney, Dichter, & McDonald, 2012) helps to build in the dispositions as students become online critical friends to each other's work. Through the discipline of a protocol, they learn to question thoughtfully, to listen carefully to understand the intention of the person whose work they are reviewing, and to make certain that the work is striving for accuracy and that it has taken multiple perspectives into account. In other words we are encouraging students to share their strategies for developing problem-solving dispositions.

Measuring Affective Responses In The Future
New technological instruments are being developed that can pro- vide exciting ways to assess dispositions (For a more extensive review see of these new technologies, see U.S. Department of Education Office of Educational Technology, 2013, pp. 60–63). (See also: Yuste, R. and Church, G. The New Century of the Brain in *Scientific American*, March 2014. Pp 38 – 45)
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Interaction patterns can be explored by tracking eye moments to see where learners focus attention during problem solving. Conati and Merten (2007) used an eye-tracking device to examine metacognitive behaviors that are relevant for learning mathematical functions. The device provided information about how learners explored the stimuli, in this case the relationship between a function's graph and equation.

There are several examples in other types of digital learning environments. Conati and colleagues studied behaviors in a digital math learning environment and found that learning goals associated with self-reported conscientiousness, "learning math," and "succeeding by myself " were associated with particular inter- action patterns—using a "magnifying glass" to see a number's factorization, asking advice often, and following advice often (Conati & Maclaren, 2009; Zhou & Conati, 2003). Winne and colleagues examined how a suite of study tools, *gStudy* (http://www .learningkit.sfu.ca/),

can provide evidence of learning strategies. The software detects when learners create notes, which information is selected by the learner to address in the note, and how the learner classifies this information on the basis of the note tem- plate selected (Winne et al., 2006).

Examples of affective computing methods are growing. Mcquiggan, Lee, and Lester (2007) have used data-mining techniques as well as physiological response data from a biofeedback apparatus that measures blood volume, pulse, and galvanic skin response to examine student frustration in an online learning environment.

The MIT Media Lab *Mood Meter* (Hernandez, Hoque, & Picard, 2012) is a device that can be used to detect emotion (smiles) among groups. The Mood Meter includes a camera and a laptop. The camera captures facial expressions, and software on the lap- top extracts geometric properties on faces (like distance between corner lips and eyes) to provide a smile intensity score.

It is possible to examine which parts of the brain are active during times of anxiety or stress and the effects of some interventions. Slagter, Davidson, and Lutz (2011) investigated the effects of systematic mental training and meditation to enhance cognitive control and maintain optimal levels of arousal. Motivation was found to be associated with greater activation in multiple brain regions. Moreover, studies have reported functional and structural changes in the brain and improved performance of long-term practitioners of mindfulness and concentration meditation techniques that enhance attentional focus. These initial findings are promising evidence of the brain's plasticity.

CASTING CALL: ENTER THE HABITS OF MIND!
By
Nancy Skerritt

My daughter Jessica is an actress. She was recently cast in the starring role of Cinderella and is delighted with the opportunity to showcase her talents throughout this Roger and Hammerstein Musical. Every actor's dream is to be the star of the show! However, a musical like Cinderella needs more than a leading lady. Rich productions rely on supporting leads and talented actors to make up the ensemble. Whether the cast member is the star of the show or in a minor role, the production is enhanced by all of the parts.

Think about the Habits of Mind[1] as actors in a play, and imagine them being cast in every lesson that is taught. Sometimes the Habit is the star of the show, and we present a direct instruction lesson where the Habit of Mind takes center stage. The Habit **is** the lesson objective. Subject area content in these lessons becomes a vehicle for developing a deep understanding of the identified Habit of Mind. The students explore definitions, looks like and sounds like qualities, and application. They focus primarily on the Habit just as an audience focuses primarily on the leads.   For this day, in this lesson, the Habit of Mind takes the lead and becomes the star with all attention directed at the qualities and characteristics represented by the selected Habit of Mind.

Let's cast *Listening to Others with Understanding and Empathy* as the star in a middle school unit that focuses on the American Civil War and slavery. The teacher has selected this Habit of Mind for multiple roles in the unit because she wants her students to apply empathy to the diverse points of view represented by people in the North and the South. Today, empathy will be the star of her lesson! She guides the class through a reflective process where the students are first asked to recall what the word empathy means to them. She encourages the students to use mind mapping as a vehicle to draw upon background knowledge and suggests that the students use words and pictures to unpack their thinking.

After inviting students to share their ideas, the teacher directs the students to use dictionaries and thesauruses to research the meaning of the word and to compare what they discover through the resources to their own reflections. Together, the class constructs a common and shared definition for this starring Habit of Mind: demonstrating sensitivity and understanding toward others. To deepen   the learning, the teacher directs the students to work in trios to develop a list of descriptors for empathy. What would it look like and sound like for a person to demonstrate sensitivity and understanding toward others? After small group work time, the teacher facilitates a process for creating a classroom check list that will be used to find evidence of empathy in stories, historical figures, and human interactions.

Empathy has been the star of the show in class today! The teacher has spot lighted the definition and attributes of empathy by maintaining a focus on the Habit of Mind throughout the lesson. Tomorrow, the teacher plans to cast empathy is a supporting lead. This time, Empathy will share the stage with a picture book entitled *The Tin Heart* by Karen Ackerman. This book depicts the conflicts among families in the North over the issue of slavery. Students are asked to use the checklist for empathy developed in the starring role lesson and apply this check list to each of the main characters in the story. Through this process, the students discover differing points of view toward the issue of slavery and begin to understand how conflict ran deep during this painful time in American History. While empathy was not the lesson objective, this Habit of Mind was woven throughout the lesson as a tool to support understanding. Students applied their knowledge of empathy to new characters and learned an important historical theme: Deeply held beliefs can create divisiveness and conflict. We can apply empathy or sensitivity as we explore different points of view. Rather than rushing to judgment, we can first seek to understand and then form our own opinions. Empathy played the role of supporting lead in this lesson. In this role, the Habit was reinforced throughout the lesson to further the content objectives.

Great productions require quality ensembles to build depth and provide background. Without the support of minor characters, a story like Cinderella would fall flat. People need to be at the ball, mice must sew the dress, and footmen have to drive the coach. While we may not see a certain character with frequency in a show, we are very much aware of the character's contribution in the scenes where that individual plays a role. So it is with the Habits of Mind. Habits bring value added to any lesson by reinforcing attitudes in the student or illustrating characteristics in the content.

Our skilled history teacher continues to cast Empathy in the lessons that make up her unit on the American Civil War. After teaching a lesson on slavery, she draws closure by asking her students to reflect on how the character in the picture book she has shared demonstrates empathy for the slaves in the south. While the main focus of the lesson is on making inferences from the picture book *Sweet Clara and the* Freedom *Quilt* by Deborah Hopkinson, the lesson presents an opportunity to reinforce the Habit of Mind of Empathy. The teacher cast Empathy in an ensemble role and in doing so, adds a layer of depth to the lesson, reinforcing a valuable Habit of Mind. My daughter Jessica will always prefer the lead roles. However, major productions are all made possible by casting actors as supporting leads and as ensemble members. The Habits of Mind can and should have a role in every lesson. In a few of the lessons over the course of a school year, the Habit should be the star. Students need direct instruction in the Habits of Mind to build conceptual understanding and to practice both identifying and demonstrating each of the Habits. Habits will also have roles as supporting leads in lessons where they a seen throughout the lesson but in the service of content goals. Finally, any lesson benefits from Habits cast in ensemble roles. These minor references are how habits are developed. They must be practiced repeatedly and applied continually in order to become habitual.

DECLARATION ON EDUCATION FOR LIFE:
Creating a Global Groundswell for Real Learning

1.Education should prepare all young people to deal well with the real challenges of life. It should enable them to deal with tricky situations, learn difficult things, and think clearly and ethically about what matters.

2.Schools should be models of places where students learn how to live together with civility and respect for differences and commonalities.

3.We must find the voice to speak out with a passionate understanding that schools can and must be transformed. We must not allow ourselves to remain dispirited. Rather, we must change the narrative of what education must be in the 21st century.

4.To flourish in the real world, children need more than literacy, numeracy and knowledge. They need qualities of mind such as curiosity, determination, imagination and self-control. Children who have discovered the deep pride that comes from crafting and mastering things to the very best of their ability carry their habits of careful thinking and self-discipline into the examination hall and onto the playing fields of life.

5. We must find ways to document and account for how students develop the dispositions that will give them the courage to become thoughtful citizens.

6. We must invest in teachers' ability to know their students at a deeper level, and to know what kinds of evidence of their growth will be valid and reliable. Targeted and sophisticated professional development for teachers is a vital ingredient of the development of 21st century education.

7. We must recognize the gifts of all students. Not all kids are bound for college or university – nor should they be. People whose talents and interests lie in practical and physical expertise – in making, doing, crafting and fixing things – are not less intelligent than those whose bent is for arguing, writing and calculating, and they are no less worthy of our respect and admiration. In fact, extended, practical problem-solving and project work can develop positive dispositions towards learning more effectively than academic study. Scholarship is an honorable craft – and so is fixing engines. Even in the digital age we need more skilful, ingenious mechanics than we do philosophers.

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Readers are encouraged to reproduce and widely distribute this declaration, "Creating a Groundswell for Real Learning" along with reference to this book, Costa, A. & Kallick. B. (2014). *Dispositions: Reframing teaching and learning.* Thousand Oaks, CA: Corwin. Permission is granted for the declaration only.

[1] Costa, A. and Kallick, B. (2009) *Learning and Leading with Habits of Mind: 16 Characteristics for Success*. Alexandria, VA: Association for Supervision and Curriculum Development