STUDENTS: Habits of Mind Explanation



By Art Costa, Bena Kallick, and Allison Zmuda

It is clear that doing well on tests will not be enough to deal with complex problems in your lives. You will need to learn thinking skills that will prepare you to apply learning in unfamiliar situations. Habits of Mind are dispositions people use when confronted with problems and situations to which the answers are not immediately apparent. 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 use those intellectual behaviors.

Thinking About Your Thinking (Metacognition)



Thinking about your thinking is something that we all do - a way for us to become more aware of our thinking and, as a result, take charge of it. When we talk to ourselves as we think through a challenge, we are using metacognition. For example:

- Athletes often talk to themselves about the strategies they want to use before the game.
- Musicians are aware of their performance as they are on the stage as they work to line up with the overall sound.
- Engineers review how a prototype worked to see how they can make it work better.

In each of these instances, the individual is aware of their thinking in relation to their performance — either before the performance when planning, during the performance when they are monitoring, or after the performance when they are modifying for the next time. In other words, they are thinking about their thinking.

You can use your brainpower to create a cycle to improve your thinking. As you become more aware of it, you are more able to take charge of your thinking. This metacognitive capacity distinguishes us from all other living things — to plan and execute a strategy, to monitor your own steps, and reflect and evaluate how it went. Try it next time you are faced with a challenge and you are not sure what to do.

Think strategically by asking:

- What are my specific goals before I begin?
- What might be a strategy to start with?
- What have I learned from other problems like this one?
- Is there a different strategy when the one I am using is not working?
- Have I considered many of the options when solving this problem?
- What do I really need to do to get the best results?
- Ask yourself periodically, "How am I doing in achieving my goals?"
- How can I use what I've learned from this problem when solving future problems?

Anyone can become a stronger thinker by using metacognition to handle more complex, creative, and interesting challenges in school and in your life.



Persisting



Do you ever give up when the answer to a problem is not immediately found? Do you ever say to yourself, "I can't do this," "It's too hard." Do you sometimes write down any answer just to get the task over with as quickly as possible? We all have faced this from time to time.

What we often don't realize is that we can be in control of those behaviors—if we want to! When you recognize that you are stuck, think about some possible strategies, such as:

When you are working through a problem...

- Stop and analyze what the problem was asking in the first place.
- Break the problem apart into steps and identify on the calendar when the task is due.
- · Think of another strategy and try it.
- Seek help or feedback from someone.

When you need inspiration...

- Celebrate progress you are making along the way and anticipate your next steps.
- Imagine what it will look and feel like when you are successful. Use that for motivation to lift you up during the frustrating parts.
- Find motivating <u>quotes</u> from your heroes who persisted. All of the greats struggled as part of their ultimate accomplishments and contributions to the world.

When you need a break...

- Focus on slowing down your breathing. For example, inhale for the count of five, exhale for the count of five and repeat for a minute.
- Take a break. Sometimes walking away from a problem and doing something else opens up new ideas.
- You no doubt have many strategies that you've used when you were committed to achieving an important goal. It may be helpful to keep your own list of ideas and share with others. Keep telling yourself to hang in there and stick to it.

Managing Impulsivity



Have you ever jumped right into working on a problem without reading all of the directions? Did you find that you missed something important and you have to start all over again? Do you ever blurt out ideas without thinking about how what you say might impact people you are interacting with? Have you ever found yourself interrupting someone else's thinking without considering what the other person meant?

These behaviors all point to the need to manage your impulsivity — slowing yourself down to think more about what you are about to do before you do it. Managing impulsivity means thinking before acting. You work to remain calm, thoughtful, and deliberate when working through a problem or developing an idea.

So what does it look like when you are managing impulsivity? Here are some tips:

- Consider the situation you are in. How does it make you feel? How might you manage those feelings so that you can take appropriate action?
- When you are working in a group, establish group rules to make certain that everyone has a voice in the discussion.
- Count to 3 (1 Mississippi, 2 Mississippi, 3 Mississippi) before adding your ideas to the conversation. That way if the person wants to finish a thought they have space to do so.
- Remind yourself that how you are feeling does not need to be acted on. Name the emotion. For example: "I'm angry." "I'm upset." or "I'm tired. Then wait instead of getting carried away into a response or a reaction.
- Be aware of the impact of your impulse to act and yourself slow down before responding. Stop and think before you act.

Striving for Accuracy



What does a ballerina, a baker, a game designer, and a plumber have in common? They all focus on craftsmanship and take the time to refine their products. Too often we think of accuracy and precision as the end game — we get the "right" answer or complete the task and move on. However, striving is a word that implies continuous effort. No matter how good you are at something, craftsmanship requires continuous reworking to grow your expertise.

Here are some strategies to consider to motivate you to set goals to continue toward even greater work:

- Organize yourself so that you have the time to put careful attention to your work.
- Ask others to give you specific feedback on questions you have about your work.
- Remember that you are in control of your work and you can decide to make it better. Sometimes too much emotional attachment does not help you to constructively improve.
- Study the work of experts in the field in which you are interested. Perhaps you can arrange to interview someone to learn more about their craftsmanship.
- Use scoring/technical criteria to assess your work in progress and identify possible next steps.
- Recognize when you are getting better at what you are working on to give you the encouragement, inspiration, and stamina to become even better at it.
- Verify claims with credible facts and evidence. Be alert to misinformation, false advertising, and trustworthiness of media sources.

Listening with Understanding and Empathy



Ever find yourself saying, "I hear you" when, in fact, you are not really listening? Ever wonder whether someone is really paying attention to what you are trying to say? Good listening can be difficult because it requires keeping focused on what the other person is saying and not interrupting with your own thoughts. Ears operate at the speed of sound, which is far slower than the speed of light the eyes take in. When you are listening, you are also learning how to become more comfortable with silence so you can slow your mind's hearing to your ears' natural speed. You listen not only for what someone knows, but also for what they are trying to represent through their facial expressions, body language, voice intonation and eye movements.

A primary strategy you can use for becoming a better listener is *the 3 Ps: pause, paraphrase, and probe.*

PAUSE

WHY: Effective listeners need to learn how to "pause their brain" and set aside their own thoughts.

HOW: Wait time. Being silent to make sure the other person has finished their thought. It is often difficult to manage impulsivity and be silent. Many people use strategies such as counting to 20 or looking down at notes they are taking.

PARAPHRASE

WHY: Letting others know that you are trying to understand them and that you value their ideas and thoughts.

HOW: Sentence stems such as: "You're suggesting that....." "Your idea is......" "You're upset because......"

PROBE

WHY: Showing others that their ideas are worthy of exploration and consideration AND demonstrating your desire to understand more fully before trying to respond with suggestions or advice.

HOW: Sentence stems or clarifying questions such as: When someone uses terminology or words that are vague, the listener clarifies to make certain they understand. This shows their interest in what the other is saying. "Say more about your ideas on "What did you see in the text that led you to make that inference?" "Explain what you mean by..."

Good listening often leads to even better ideas than the ones inside our heads.



Thinking Flexibly



Do you ever find yourself fixed in your way of looking at a problem or understanding others' perspectives? You may need to think more flexibly. Flexible thinkers stay focused on the challenge at hand, draw upon a range of strategies, and know when to think more broadly or when to zero into a more detailed view. Flexible thinkers have the capacity to change their minds as they receive additional data. They create and seek novel approaches and consider possible intended and unintended consequences.

How are you developing your capacity to think flexibly? Can you:

- Shift and see multiple points of view? This helps to empathize with other's feelings, predict how others are thinking, and anticipate potential misunderstandings. They are able to work with people from different cultures and who represent different perspectives recognizing other people's ways of experiencing and making meaning. Try asking: If I were _____ (this person), how would I feel? What can I learn from someone with whom I disagree?
- Zoom out to see the big picture and zoom in to see a detailed view of the same problem, issue, or challenge? Try asking: As I consider this plan, what are my long-range goals and what immediate steps must I take to achieve them?
- Work within rules, criteria and regulations to generate fresh ideas rather than feeling stuck? Try asking: What are the rules that I need to be mindful of as I design a solution? How would someone else look at this plan?
- Tolerate confusion and ambiguity because you believe that they can figure it out? They are willing to let go of a problem trusting their subconscious to continue working creatively and productively. *Try asking: What are some alternative solutions to this problem?*

Questioning and Posing Problems



Asking questions and posing problems can be a signal of your genuine curiosity and commitment to a topic. In addition, a question might lead to discovering a problem that has not yet been solved. Sometimes you may not know how to ask a question because you are not yet certain what sort of information you need. You may be asking simple questions without realizing that they are leading to more complex issues. You may be looking for a "right" answer when, in fact, you are exploring a topic.

When you ask questions, you are filling in the gaps between what you know and what you don't know. For example, consider the following categories and related questions to see how it might shape your inquiry:

- Request data to support others' conclusions and assumptions.
 - "What evidence do you have.....?"
 - "How do you know that's true?"
 - "How reliable is this data source?"
- Seek alternative points of view.
 - "From whose viewpoint are we seeing, reading of hearing?"
 - "From what angle, what perspective are we viewing this situation?"
- Search for causal connections and relationships.
 - "How are these people (events) (situations) related to each other?"
 - "What produced this connection?"
- Suggest hypothetical problems.
 - "What do you think would happen IF.....?"
 - "IF that is true, then what might happen if....?"
- Search for interconnections among ideas.
 - "How might this idea connect to those other ideas?"
 - "What if we made a synthesis of these ideas?"
- Search for puzzles or discrepancies.
 - "Why is this idea presented here?"
 - "Is there some greater idea that I am missing here?"
 - "How might this new piece of information change the way I am thinking?"
- Inquiring about others' emotions.
 - "What caused you to feel that way?"
 - "How do you feel when....."

Thinking Interdependently



Did you know that you have a social brain? In prehistoric times, successful hunters and gatherers discovered they had a better chance of survival if they worked together with others. Eventually the human brain evolved into a social brain where people were thinking interdependently. Interdependent thinkers have a sense of community: "we-ness" as much as "me-ness." They contribute to a common goal, seek collegiality, and draw on the resources of others.

So how do our social brains work in the times we live in now? The world is faced with such diverse needs and problems to solve. We need to seek out and study as many points of view as we can in order to make critical decisions that impact our local, national, and global communities.

Working in groups is more than cooperation. It requires your ability to justify your ideas and to allow yourself to be open to the ideas of others. Here are some tips to develop thinking interdependently in any group.

- *Establish roles* in the group to keep meetings purposeful. For example: facilitator, time keeper, recorder.
- **Test the feasibility of solutions** you pose by hearing what others think. You need to be willing and open to feedback from a critical friend. Through this interaction the group and the individual continue to grow.
- *Listen closely* to others and seek consensus when appropriate.
- Agree on group norms and call time out when the group is not working productively.
- **Be okay with disagreements**. Conflict about ideas, plans, and points of view can be healthy and productive. They can be opportunities to learn, modify thinking, and generate new ideas.
- Learn how to give up on your idea when it is not working and engage with the ideas of others.

Thinking and Communicating with Clarity and Precision

Do you ever hear your friends, siblings or adults in your life using vague and imprecise language? They describe objects or events with words like "weird," "nice," or "OK" rather than telling you more clearly what they were thinking. You might want to know what was "weird" about the movie or why the party was "nice." They may call specific objects using such non-descriptive words as "stuff," "junk" and "things." The problem is that you do not know exactly what the person is referring to—what is the "stuff?"

Language and thinking are closely entwined. Like either side of a coin, they are inseparable. Your words represent your mind. When you use fuzzy language, it is a reflection of fuzzy thinking. As you strive to communicate more precisely and accurately, you become a better messenger of your ideas. Instead of using overgeneralizations such as "everybody does it," you support statements with explanations, comparisons, quantification, data and evidence. So how can you become more skillful in thinking and communicating with clarity and precision?

A few strategies include:

- Examine writing or illustrations that need to focus on precision. For example, when developing a graph have you included appropriate terminology, labels, and units of measure? When writing a newspaper article, did you use correct names and verifiable details?
- Mental rehearsal. Inside your head, practice what you are going to say before you say it. For example you can rehearse in front of a mirror or record yourself and play it back.
- Pay attention to the words that are chosen in writing or speaking. Observe other people's language as well as your own. When you observe the use of:
 - Vague nouns and pronouns such as in "they" or "students." Press for specificity by asking, who specifically?
 - Vague verbs, such as "understand" or "improve." Ask what these terms mean.
 - Comparators, such as "better" or "larger." The issue is, better than what or larger than what. Ask to get clarity.
 - Generalizations, such as "Everybody?" or "All the time?" Check to see if it really is everybody-- even your neighbor? or all the time—each and every time?



Applying Past Knowledge to New Situations



New learning can be challenging and too often we forget what we already know. Sometimes we approach a situation as if it is the first time seeing such a problem or task. Using what you already know about the content taps into your memory bank of learnings. In the same way, paying attention to what you know about your process of learning can also be helpful. For example, you may remember how you solved a problem or learned a new skill. Your transfer of that learning to a new situation builds your intellectual muscles. Learning is not just an accumulation of isolated facts or skills — it is finding the connections or patterns that paint a bigger picture that is more easily stored in your memory for future use.

We learn from reflecting on and making sense of our past experiences.

As you begin any new learning, ask yourself such questions as:

- What does this situation or problem remind me of?
- · What do I already know about this?
- How is this just like the time when I ...?
- What are some experiences that I can relate this to?
- What parts of the situation or problem do I need more clarity on?
- What words am I unclear about?
- What about this is just like something else I know? Can I come up with an analogy such as "when I see this, it is just like this... or the way this operates is just like the way XX operates."

As you are finishing a particular task, reflect on questions that will help you transfer your learning to new situations, such as:

- What strategies were most helpful to me? When else in (school) (life) (work) might this strategy be useful?
- What new ideas or insights did I have when working on this topic?
 What insights might influence me as I take on another challenge or project?
- What I really don't want to happen again...
- What I would like to happen again...
- What I don't want to forget...
- How can I use this information elsewhere in the future?



Gathering Data Through All Senses



Learning about the ways that your brain gathers and stores information can help as you are learning. All external information gets into your brain through one of these sensory pathways to sharpen mental functioning:

- **gustatory:** the tastes you gather through your mouth.
- **olfactory:** the smells you inhale through your nose.
- tactile: the sensations you feel through your skin.
- **kinesthetic:** the positions you take through your movements and posture.
- auditory: the sounds you hear through your ears.
- visual: the sights you see through your eyes.

Most learning comes from the environment by observing or taking in through the senses. Mathematicians form mental images in their minds to visualize a problem or scenario. Social scientists solve problems through scenarios and role-playing. Auto mechanics learn through hands-on repairs. Weavers try out combinations of colors and textures to create a design. Chefs use ingredients and techniques to experiment with flavors and textures. We deepen our knowledge as we experience more in the world.

We gather data from internal sources as well. If you are in touch with your own emotions, you are also in touch with the physical sensations in your body. For example, you know that you are fearful because your heart rate begins to speed up, your stomach clenches, and your hair stands on end. You sense what other people are experiencing or feeling by sensations that arise in our own bodies. All of us are like walking antennae, receiving and registering the felt experience of those around us. Some of us are better at this than others. To accurately register this kind of information requires being in touch with our own emotional responses.

- Pay attention to the world around you. Ask yourself: What am I noticing in my environment? What details capture my attention?
- Deliberately use your senses when you are trying to remember something. For example, draw (or find) a picture that captures the idea. Act out a historical event to capture the feeling or mood.
- When engaging in a new topic or problem, ask yourself, What sources of data should I consider? How is what I am experiencing impacting my thinking?
- **Keep a noticing notebook.** Keep a noticing notebook where you can enter sketches, drawings, photos or anything that captures senses.
- Zoom in, zoom out. Look at something with a magnifying glass or take digital photographs to see different perspectives on the same object.



Creating, Imagining, and Innovating



Many people assume that creativity is a rare commodity that someone is born with or not and that it is reserved for the elite among us: artists, writers, and composers, or the likes of Miles Davis, Steve Jobs, or Frida Kahlo. Everyone has the capacity to generate novel, original, clever or ingenious products, solutions, and techniques—if that capacity is developed. Research shows us that we are all born with the capacity to push the boundaries of our thinking. Your brain is always looking for something that it didn't know before, that's not being taught to it, and to find a way to figure something out: that is creativity.

When you are building the capacities for creating, imagining, and innovating you are skillfully learning how to push the boundaries of your thinking. Imagining is generating new ideas without concern for the possible. Creating is giving form to ideas with the goal of taking something that is possible and making it come to life. Innovating is taking an existing system or idea and making improvements — perhaps focusing on simplicity, improved effectiveness, or beautifying its form. These capacities can be developed in small moves as well as in more formal products or creations.

Some of these strategies might help you build your skills:

- Go ahead, take a risk! When you try something and it doesn't turn out the way you hoped, it isn't a failure. Rather, it provides a rich opportunity to analyze what went wrong, to learn, and to generate alternative strategies. When you are less afraid to make mistakes, you open up the environment for play and experiment.
- Think by using analogies. In what ways is a school like an airport? In what ways is soccer like a highway? In what ways is gravity like a feather? As you answer these questions, you are developing your creative capacities. You are realizing that, by comparing a main idea or topic you are working on and using a strange analogy, you may discover new and important attributes.
- **Brainstorm unexpected ideas.** Albert Einstein once said, "If at first an idea doesn't seem totally absurd there's no hope for it." Instead of feeling stuck, think outside the box. When you are imagining, move toward the fantastical or the "seemingly" irrelevant in order to create new insights rather than taking an "obvious" direction.
- **Don't take yourself too seriously.** Humor has been found to liberate creativity and provoke such higher level thinking skills as anticipation, finding novel relationships, visual imagery, and making analogies. When you are having fun with ideas, you begin to see possibilities. You begin to take on new and interesting ways of seeing.



Taking Responsible Risks

In almost every culture it seems the stories we love best are the triumph over seemingly insurmountable odds: the tale of the ordinary person who dares to try; of the unlikely hero who finds himself in a tough situation and takes on the challenge anyway — not because they are certain to win but because it is the right thing to do. Taking responsible risks calls on us to "venture out," to attempt more than we thought we could do, and to get out of our comfort zone. However, all risks are not worth taking. When we say "responsible" we mean that it is more of an "educated" risk--through your own experience and intuition, you are making a guess that you can take a chance on this.

When someone holds back from taking risks, they may miss many opportunities. For example, you may hold back in games because you are afraid of losing. Your mental voice might say, 'if I don't try it, I won't be wrong' or 'if I try it and I am wrong, I will look stupid.' Your inner voice is trapped in fear and mistrust. Instead, you can develop the capacity to live with some uncertainty— to be challenged by the process of finding an answer rather than by avoiding what you don't know. If you learn how to take a chance, you are likely to find your creative, innovative spirit, and that will help you to solve the problems of our complex, rapidly-changing world.

Some strategies that might be helpful:

- Do a cost-benefit analysis. Taking responsible risks means we bring our feelings and our knowledge to the possible actions we might take. One of the ways to do this is to ask yourself, "What would be the best possible outcomes from this venture?" What would be the worst possible outcomes?" "How serious would failure be?" "How satisfying would success feel?"
- **Preview new experiences.** Do a little research about what opportunities exist and what challenges you might face with something you are considering.
- *Give yourself a chance*. Oftentimes, experiences that push you outside of your comfort zone can be really uncomfortable. Perhaps a fear of feeling stupid or not getting it quickly can make you want to quit. But venturing out requires courage in new territories.
- Develop an encouraging inner voice. Encouraging, positive self-talk can help you take the risk. Try saying to yourself, "If I don't try it, I will never know if I can do it." Ask yourself, "what's the worst that can happen if I do this?"



Finding Humor



Keeping your brain active by finding the humor in situations, especially when things are not going well, provides some relief from stress or frustration. Your appreciation and use of humor can help you bounce back from adversity and feel more resilient. Sometimes you laugh at yourself to relieve your own embarrassment.

Understanding humor requires thinking flexibly—finding novel relationships, observing oddities in images, and making analogies. When you engage in humor you can see situations from a new vantage point or come up with the unexpected. For example, notice the twist in this one:

What is the astronauts' favorite place on the computer? The space bar!

Having a whimsical frame of mind, you can find and appreciate absurdities, ironies, and satire which helps find needed lightness in situations. However, you can be quick-witted yet sensitive to knowing the difference between clowning around and using humor to raise people's spirits. Our attempt to find humor in a situation needs to be attentive to the context.

- Is this a good time to say something funny?
- Am I paying attention to how others are feeling?
- Might what I think is funny actually be hurtful to someone else?
- What can I do if my humor is interpreted as hurtful to someone?
- When could my use of humor be distracting?

Responding with Wonderment and Awe



We all share the capacity for wonderment, awe, inquisitiveness, intrigue, curiosity and mystery. For example, you may have reflected on the changing formations of a cloud; felt charmed by the opening of a bud; were awestruck by the logical simplicity of a mathematical order; found beauty in a sunset; felt intrigued by a spider web; and exhilarated at the iridescence of a hummingbird's wings. The capacity for wonderment and awe represents the best of humanity, the heights of what we can accomplish through ingenuity, persistence, and cooperation.

When the world around us sparks our interest and ignites our sense of wonder, we are inspired to learn, to explore, to imagine possibilities. Strategies to help provide experiences that trigger that sense of amazement and wonder:

- Use the <u>See, Think, Wonder</u>, thinking routine. Pay attention to something that you may be awestruck by-- ask yourself--what is it that I see here? What does it make me think about? What do I wonder?
- **Explore new places**. Take a walk outside, visit a museum, listen to music, watch a TED talk. Whether these are virtual or physical experiences, give yourself time to really pay attention to what amazes you.
- Keep a notebook or journal. Make a list, draw, photograph, or describe experiences or ideas that you have found to be delightful, magical, or wonderous.

"Without awe life becomes routine...try to be surprised by something every day." — Mihalyi Csikszentmihalyi

Remaining Open to Continuous Learning



Life is a continuous journey of learning. No matter how much we know, there is always something new to learn. There is humility in saying "I don't know," and open ourselves up to the challenge to move into new territory. However, this does not necessarily stop with just acquiring more knowledge about a topic. It might also result in expanding our networks of expertise. We also might reflect on the process of how I am learning: investigating and constructing with an open mind.

Here are some strategies that could guide your lifelong quest for learning:

- Have humility and pride when admitting you don't know. Reframe this as a launch for exploration, curiosity, and mystery rather than a limitation.
- Ask questions and seek connections. Deep learning is fueled by an inquisitive mind, developing capabilities for effective and thoughtful action.
- Continue to discover who you are and how you see the world. Ask questions, such as: What motivates me to keep learning? What do I still wonder about? How will I remain open to new ideas? Or new learning?
- **Seek feedback to grow your thinking.** Consider who might engage with you about your ideas. Perhaps it is someone you trust who can take the time to understand and help you critique your thinking.
- **Ask an expert.** Seek guidance from someone that you don't know very well but is an expert in the field. It would be helpful to construct questions in advance to frame the conversation.