



THE INSTITUTE FOR
HABITS OF MIND

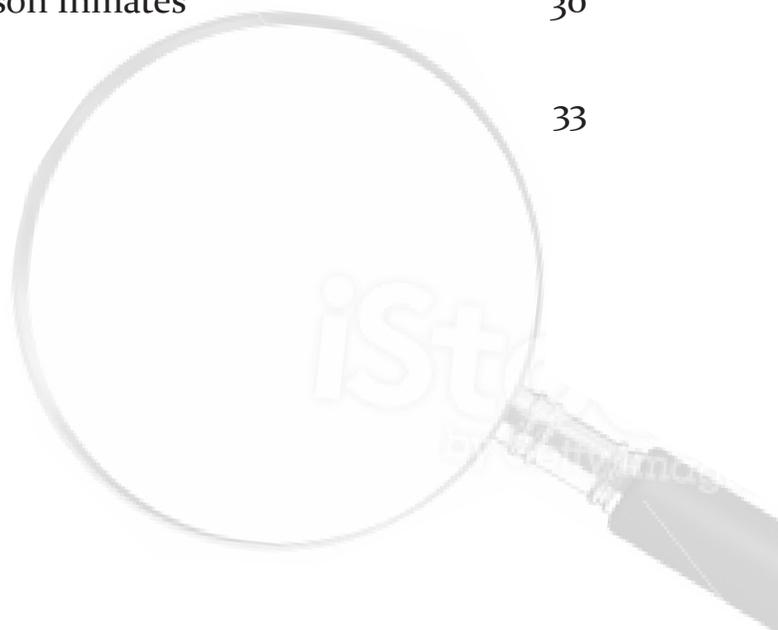
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FOREWORD

In 1984, while editing the first edition of *Developing Minds: A Resource Book for Teaching Thinking*, one chapter particularly intrigued Art. Alan Glatthorn and Jonathan Baron (1985) contributed it, and they described the attributes of effective problem solvers and decision makers in many walks of life.

At that time, Art was also conducting training with teachers and school staffs in Reuven Feuerstein's Instrumental Enrichment (Feuerstein, Rand, Hoffman, & Miller, 1980), a program intended to remediate learning deficiencies. He was also influenced by the work in thinking skills by Edward de Bono (1991), critical thinking by Robert Ennis (2001), and redefining intelligences by Art Whimbey (1975), Bob Sternberg (1983, 1984; Sternberg & Wagner, 1982), and David Perkins (1985, 1995).

While reading each author's contribution, Art began to see some recurring patterns and themes. While the writers approached their topics from different perspectives and they had different labels, their intentions were similar. They wrote about being flexible and open-minded, monitoring one's own thoughts and actions, being curious and having a questioning attitude, and so forth. Gradually, putting all this together in his mind, Art began to synthesize these authors' ideas into what he called "Intelligent Behaviors."

Art began to wonder whether these attributes of intelligent, creative, effective decision makers and problem solvers could be isolated, described, and taught to students so that they, too, would be successful in school, in college and/or careers, and in life. This synthesis of a vast array of research studies compiled by Jenny Edwards supports this hypothesis.

In 1998, Art and Bena started working together. They renamed the Intelligent Behaviors, added to the original list of behaviors, and called them Habits of Mind. Their purpose in renaming them was to help people to understand that "intelligent" behaviors were really a set of cognitive dispositions that, when practiced with frequency, could become habits of the mind. Lauren Resnick (2001) influenced Art and Bena with her statement, "One's intelligence is the sum of one's habits of mind" (p. 4). Of course! We're not talking about behaviors, we're talking about getting into the *habit* of effective thinking. We are not just solving a problem; we are becoming effective problem solvers. We are not merely learning some skill; we are open to continuous learning. With Bena Kallick as co-editor, we published *Learning and Leading with Habits of Mind* (Costa & Kallick, 2009). Since that time, the Habits of Mind have spread around the world to the Middle East, Asia, South Africa, Central and South America, and Australia and New Zealand, as well as throughout the United States.

To understand the intent of Habits of Mind requires a *shift in perspective* about what is important in learning. Traditionally, teachers and parents are impressed by how many answers a student knows—scores on tests, for example. But if we embrace the Habits of

Mind, not only are we interested in how many answers students know; we are more impressed by how students behave when they don't know the answer!

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 student performance under those challenging conditions that demand strategic reasoning, insightfulness, perseverance, creativity, and craftsmanship to resolve a complex problem. Habits of Mind are performed in response to questions and problems the answers to which are NOT immediately known. When we 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 on these intellectual resources, the results are more powerful, of higher quality, and of greater significance than if we fail to employ those intellectual behaviors. The critical attribute of efficacious human beings is not only having information, but also knowing how to act on it.

Employing Habits of Mind requires a composite of skills, attitudes, cues, experiences, and proclivities. It means that we value one pattern of thinking over another; therefore, it implies making choices about which pattern to employ 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 we employed these behaviors, the effects of their use are reflected on, evaluated, modified, and carried forth to future applications.

We are extremely grateful to Jenny Edwards for her persistence in striving for accuracy, flexibility, clear and precise language, and her openness to continuous learning. She has synthesized substantial research that indicates that students, from elementary grades through adulthood, prosper intellectually, socially, and emotionally as they learn Habits of Mind. Teachers form stronger bonds with colleagues, schools develop a culture of mindfulness, and individual teachers report renewed dedication, energy, and excitement about their teaching.

This publication will be a valuable resource to those who wish to deepen their understanding of Habits of Mind and those who wish to share the impact of Habits of Mind with others who may ask, "What evidence do you have that all this works?"

Investigating, adopting, implementing, and sustaining the Habits of Mind takes time.

The journey toward internalization is never fully complete, and that is what gives the Habits of Mind dignity. They are as good for adults as they are for students. All of us can

get better at the Habits of Mind. We encourage more researchers to conduct studies on the Habits of Mind.

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References for the Foreword

- Costa, A., & Kallick, B. (2009). *Learning and leading with Habits of Mind*. Alexandria, VA: Association for Supervision and Curriculum Development.
- de Bono, E. (1991). The CoRT Thinking Program. In A. L. Costa (Ed.), *Developing minds: Programs for teaching thinking* (pp. 27-32). Alexandria, VA: Association for Supervision and Curriculum Development.
- Ennis, R. (2001). Goals for a critical thinking curriculum and its assessment. In A. L. Costa (Ed.), *Developing minds: A resource book for teaching thinking* (3rd ed., pp. 44-46). Alexandria, VA: Association for Supervision and Curriculum Development.
- Feuerstein, R., Rand, Y., Hoffman, M., & Miller, R. (1980). *Instrumental enrichment: An intervention program for cognitive modifiability*. Baltimore, MD. University Park Press.
- Glatthorn, A., & Baron, J. (1985). The good thinker. In A. L. Costa (Ed.), *Developing minds: A resource book for teaching thinking* (pp. 49-53). Alexandria, VA: Association for Supervision and Curriculum Development.
- Perkins, D. (1985). What creative thinking is. In A. L. Costa (Ed.), *Developing minds: A resource book for teaching thinking* (pp. 85-88). Alexandria, VA: Association for Supervision and Curriculum Development.
- Perkins, D. (1995). *Outsmarting IQ: The emerging science of learnable intelligence*. New York, NY: Free Press.
- Resnick, L. (2001). Making America smarter: The real goal of school reform. In A. L. Costa (Ed.), *Developing minds: A resource book for teaching thinking* (3rd ed., pp. 3-6). Alexandria, VA: Association for Supervision and Curriculum Development.
- Sternberg, R. (1983). *How can we teach intelligence?* Philadelphia, PA: Research for Better Schools.
- Sternberg, R. (1984). *Beyond IQ: A triarchic theory of human intelligence*. New York, NY: Cambridge University Press.
- Sternberg, R., & Wagner, R. (1982). *Understanding intelligence: What's in it for education?* Paper submitted to the National Commission on Excellence in Education.
- Whimbey, A. (with Whimbey, L. S.). (1975). *Intelligence can be taught*. New York, NY: Erlbaum.

THE SIXTEEN HABITS OF MIND

 <p>1. Persisting <i>Stick to it!</i> Persevering in task through to completion; remaining focused. Looking for ways to reach your goal when stuck. Not giving up.</p>	 <p>2. Managing Impulsivity <i>Take your Time!</i> Thinking before acting; remaining calm, thoughtful and deliberative.</p>
 <p>3. Listening with understanding and empathy <i>Understand Others!</i> Devoting mental energy to another person's thoughts and ideas; Make an effort to perceive another's point of view and emotions.</p>	 <p>4. Thinking flexibly <i>Look At It Another Way!</i> Being able to change perspectives, generate alternatives, consider options.</p>
 <p>5. Thinking about your thinking (Metacognition) <i>Know your knowing!</i> Being aware of your own thoughts, strategies, feelings and actions and their effects on others.</p>	 <p>6. Striving for accuracy <i>Check it again!</i> Always doing your best. Setting high standards. Checking and finding ways to improve constantly.</p>
 <p>7. Questioning and problem posing <i>How do you know?</i> Having a questioning attitude; knowing what data are needed & developing questioning strategies to produce those data. Finding problems to solve.</p>	 <p>8. Applying past knowledge to new situations <i>Use what you Learn!</i> Accessing prior knowledge; transferring knowledge beyond the situation in which it was learned.</p>
 <p>9. Thinking & communicating with clarity and precision <i>Be clear!</i> Strive for accurate communication in both written and oral form; avoiding over-generalizations, distortions, deletions and exaggerations.</p>	 <p>10. Gather data through all senses <i>Use your natural pathways!</i> Pay attention to the world around you Gather data through all the senses. taste, touch, smell, hearing and sight.</p>
 <p>11. Creating, imagining, and innovating <i>Try a different way!</i> Generating new and novel ideas, fluency, originality</p>	 <p>12. Responding with wonderment and awe: <i>Have fun figuring it out!</i> Finding the world awesome, mysterious and being intrigued with phenomena and beauty.</p>
 <p>13. Taking responsible risks <i>Venture out!</i> Being adventuresome; living on the edge of one's competence. Try new things constantly.</p>	 <p>14. Finding humor <i>Laugh a little!</i> Finding the whimsical, incongruous and unexpected. Being able to laugh at one's self.</p>
 <p>15. Thinking interdependently <i>Work together!</i> Being able to work in and learn from others in reciprocal situations. Team work.</p>	 <p>16. Remaining open to continuous learning <i>Learn from experiences!</i> Having humility and pride when admitting we don't know; resisting complacency.</p>

ARTICLES RELATED TO THE HABITS OF MIND

Numerous authors have written about habits of mind for students from Kindergarten to Grade 12, students in higher education, and adults. This section contains some of Habits of Mind that are related to Costa and Kallick's (2000) Habits of Mind in general, as well as in specific subject areas.

THE HABITS OF MIND IN GENERAL

This section includes information about habits of mind in general for students and for adults.

For students

As early as 1992, *Sizer* proposed habits that students should practice:

The habit of perspective: Organizing an argument (read or heard or seen) into its various parts and sorting out the major matters from the minor matters within it; separating opinion from fact and appreciating the value of each.

The habit of analysis: Pondering each argument in a reflective way, using such logical, mathematical, and artistic tools as may be required to render evidence; knowing the limits as well as the importance of such analysis.

The habit of imagination: Being disposed to evolve one's own view of a matter, searching for both new and old patterns that serve one's own and others' current and future purposes.

The habit of empathy: Sensing other reasonable views of a common predicament, respecting all, and honoring the most persuasive among them.

The habit of communication: Accepting the duty to explain the necessary in ways that are clear and respectful both to those hearing or seeing and to the ideas being communicated; being a good listener.

The habit of commitment: Recognizing the need to act when action is called for and stepping forward in response; persisting, patiently, as the situation may require.

The habit of humility: Knowing one's rights, one's debts, and one's limitations, as well as those of others; knowing what one knows and what one does not know; being disposed and able to gain needed knowledge, and having the confidence to do so.

The habit of joy: Sensing the wonder and proportion in worthy things and responding to these delights. (pp. 73-74)

In 1996, *Ennis* described three broad dispositions and proposed subdispositions for each one.

1. Care that their beliefs be true, and that their decisions be justified; that is, *care to “get it right” to the extent possible*, or at least care to do the best they can. This includes the inter-related dispositions to do the following:

A. *Seek alternatives* (hypotheses, explanations, conclusions, plans, sources), and be open to them;

B. *Endorse a position to the extent that, but only to the extent that, it is justified* by the information that is available;

C. *Be well-informed*; and

D. *Seriously consider points of view other than their own.*

2. *Represent a position honestly and clearly* (theirs as well as others'). This includes the dispositions to do the following:

A. *Be clear* about the intended meaning of what is said, written, or otherwise communicated, seeking *as much precision as the situation requires*;

B. Determine, and maintain *focus* on, the conclusion or question;

C. Seek and offer *reasons*;

D. Take into account the *total situation*; and

E. Be reflectively *aware of their own basic beliefs.*

3. *Care about the dignity and worth of every person.* This includes the dispositions to:

A. *Discover and listen to others' view and reasons*;

B. *Take into account others' feelings and level of understanding*, avoiding intimidating or confusing others with their critical thinking prowess; and

C. *Be concerned about others' welfare.* (p. 171, italics in original)

Taylor (2011) discussed the importance of those who work in student affairs offices infusing habits of mind through integrative learning into their work with students in higher education. Taylor suggested that student affairs officers are in a position to assist students in learning habits of mind to enable them to make sense of what they are learning. Taylor discussed the importance of having students reflect on what they are learning in order to integrate their experiences. Taylor mentioned such habits of mind as creativity, reflection, discovery, interpreting and applying knowledge, intentional learning, contributing to the world, and making informed decisions.

Taylor (2011) built on the work of Boyer (1987) to develop the “whole student—not just intellectual capacity,” suggesting that it “maximizes students’ growth so that they may be fully contributing members to society and achieve maximum personal fulfillment” (Taylor, 2011, pp. 14-15). Taylor continued, “Content knowledge, skill development, and learning how to learn for a lifetime are the basics. In the end, it is higher education’s hope that students graduate with a more sophisticated way of knowledge and interacting with the world” (p. 15). Taylor added, “When learning occurs cognitively, affectively, experientially, and with reflection, it is more likely to become truly integrated” (p. 17). According to Taylor, “An emphasis on integrative learning asserts first and foremost that educators place students at the center of their own learning” (p. 19).

Claxton, Chambers, Powell, and Lucas (2011) identified 17 dispositions that they called “The Language of Learning Power” (p. 73): (a) Resilience, including Absorption, Managing Distractions, Noticing, and Perseverance; (b) Resourcefulness, including Questioning, Making Links, Imagining, Reasoning, and Capitalizing; (c) Reflectiveness, including Planning, Revising, Distilling, and Meta-learning; and (d) Reciprocity, including Interdependence, Collaboration, Empathy & Listening, and Imitation. They compared their list with Costa and Kallick’s (2000) list and noted that Managing Impulsivity was included in their own Managing Distractions; Taking Responsible Risks was similar to Perseverance, although it could have had “higher visibility” (p. 35); and Finding Humor could have been in the area of Imagination and Playfulness. Claxton et al.’s Absorption and Imitation were not included in Costa and Kallick’s list, according to the authors.

In 2013, **Conley** pointed out that, “when social science researchers wanted to make a distinction between how students approached different aspects of the learning process, they coined the somewhat awkward term ‘noncognitive’ to distinguish attitudes, beliefs, and attributes from content knowledge, which they labeled ‘cognitive’” (para. 1). According to Conley, this covered “everything that was not, in their view, grounded in, or directly derived from, rational thought” (para. 1). Conley suggested that, when students worked hard to achieve their goals, asked for assistance, worked collaboratively, and persisted when they were having difficulty, they were using “a higher form of thinking” (para. 3). He added that perhaps noncognitive areas could be better thought of as “metacognitive learning skills” (para. 7). According to Conley, the term *metacognitive* would fit better with *cognitive*. He concluded,

By elevating noncognitive information to an equal position relative to content knowledge, we may find the missing link needed to close the achievement gap more rapidly and effectively for the many students who possess the cognitive ability to improve their capacity to learn, but are limited by a lack of effective learning strategies and the appropriate mindset. (para. 12)

Lucas, Claxton, and Spencer (2013) emphasized the importance of students learning habits of mind. According to the authors,

Whatever else we are doing in schools, we ought to be consciously, persistently and systematically cultivating the habits and qualities of mind that we think will serve our children well, and which will add to the harmony, prosperity and creativity of the societies they live in. (p. 8)

Heick (2013) discussed seven “idea shifts” taking place in education, the second of which was “Shift From Standards to Habits” (para. 12). According to Heick, “The shift from purely academic standards to **critical thinking habits** supports personalized, 21st century learning through a preceding shift from institution to learner” (para. 13, bolding and underlining in the original).

Fletcher (2013) shared some of the outcomes of a grant from the Lumina Foundation that faculty from Cabrillo College, California State University—Monterey Bay (CSUMB), and Hartnell College had received to develop lessons to teach habits of mind to students in higher education. She defined habits of mind as “an internalized set of practices essential to critical thinking” (p. 50).

One way to make procedural knowledge (i.e., the *how*) visible to more students is by explicitly teaching habits of mind. These habits include broad, dispositional capacities—such as curiosity, engagement, persistence, flexibility, and metacognition—that support learning within and across disciplinary and institutional contexts. (p. 50)

We’ve learned that, just like rigor and joy, academic progress and personal development are symbiotic. Habits of mind uncoupled from academic content devolve into meaningless study skills and platitudes; academic content uncoupled from habits of mind devolves into perfunctory test preparation. (p. 55)

For adults

Dottin (2009) discussed the importance of dispositions, or habits of mind, for teacher candidates and teachers. He cited Costa and Kallick's (2000) *Habits of Mind* as one of several sets of dispositions. According to Dottin,

There is, consequently, a cognitive connection to habits of mind (dispositions) in that knowledge and skills must be acquired and used to enhance mindfulness and thoughtfulness. Professional educators must, therefore, demonstrate a disposition toward mindfulness and thoughtfulness in order to exercise professional judgment. Pedagogical dispositions are, therefore, habits of pedagogical mindfulness and thoughtfulness (reflective capacity) that render professional actions and conduct more intelligent. Pedagogues must, therefore, demonstrate commitments to patterns of intellectual activity that guide their cognitive and social behavior. (p. 85, italics in original)

D. Johnson (2006) discussed skills that are necessary for knowledge workers. Due to the outsourcing of numerous jobs from the United States to other countries, knowledge workers must have a high level of skills. According to Johnson, workers should have four levels of skills, beginning with basic reading, writing, and mathematics skills. Next, they should have skills in the areas of "history, social science, science, literature, and physical and cultural geography" (pp. 9-10); these are built on their reading, writing, and mathematics skills. Then, workers should have a high level of technology skills; they should know how to use technology for productivity, communication, research, problem solving, and decision making, and they should have a sense of ethics in using technology. Next, Johnson defined "Level 4: Information Problem-Solving Skills and Higher-Order Thinking Skills" (p. 10), such as knowing how to access information, knowing how to learn independently, and taking responsibility for contributing to society. Finally, he defined "Conceptual Skills" (p. 11) that knowledge workers should have, based on Pink (2005). This included skills such seeing the big picture, having a sense of empathy, knowing how to make meaning by synthesizing, creating aesthetically pleasing products, telling stories that motivate people, developing meaningful and caring relationships, having a sense of playfulness and humor, having a sense of purpose and spirituality, and knowing how to learn. Rather than focusing on using the left brain, Johnson emphasized the importance of knowledge workers using the right brain. He concluded, "As teachers, we need to model instructional design and delivery practices that build conceptual age skills. And as school leaders, we need to advocate for instructional programs that go beyond the basics, if we are to demonstrate concern for our students' futures" (p. 13).

Wurtzel (2013) served as CEO of Circuit City Stores for 34 years. He discussed the strategic planning process and shared that “even an excellent process can lead to bad planning decisions since strategy makers bring *habits of mind* that lead them to ignore the evidence or wish the problem away” (p. 16). He proposed “eight *Habits of Mind* for successful strategic planning:”

- Be humble, run scared
- Curiosity sustains the cat
- Confront the brutal facts
- Chase the impossible dream
- Maintain a current roadmap
- Mind the culture
- Encourage debate, learn from dissent
- Focus on the future (p. 16, italics in original)

THE HABITS OF MIND IN SPECIFIC SUBJECT AREAS

This section includes information about habits of mind for the subject areas of engineering, mathematics, science, and writing.

Engineering

Loveland and Dunn (2014) discussed the principles of the *Standards for K-12 Engineering Education* (National Academy of Engineering, 2010). This document included an emphasis on engineering design, the incorporation of “developmentally appropriate mathematics, science, and technology knowledge and skills,” and the promotion of “engineering habits of mind” (p. 13). “Principle 3, engineering habits of mind, was proposed as an essential skill to separate how engineers think and act from ways that academic content teachers think and act” (p. 13). The authors included “systems thinking, creativity, optimism, collaboration, communication, and attention to ethical considerations” (p. 13).

“In engineering, systems thinking refers to individual understanding that all technologies are interconnected” (Loveland & Dunn, 2014, p. 13). “Creativity implies imagination in the design process of engineering” (p. 14). In addition, students who are optimistic are “persistent in looking for solutions on how to improve technologies, whether a system, artifact, or outcome” (p. 15).

Engineering students should develop skills to collaborate with others both in person and in other countries. According to Loveland and Dunn (2014),

Communicating as a principle in engineering education focuses on two ideas: a way to understand the wants and needs of a person needing the engineering work, and a means to explain and defend choices made in the design process. This principal habit of mind describes student communication occurring at two distinct points in a project: in the very beginning of the problem-analysis stage with the customer (instructor) and at the end, when final designs and prototypes are presented. (p. 15)

Loveland and Dunn (2014) discussed the importance of engineers using critical thinking as part of communication.

Critical thinking involves logical thinking and reasoning, including skills such as comparison, classification, sequencing, cause/effect, patterning, webbing, analogies, deductive and inductive reasoning, forecasting, planning, hypothesizing, and critiquing. Creative thinking involves creating something new or original. It involves the skills of flexibility, originality, fluency, elaboration, brainstorming, modification, imagery, associative thinking, attribute listing, metaphorical thinking, and forced relationships. The aim of creative thinking is to stimulate curiosity and promote divergence. (p. 15)

Engineers must operate ethically because “any new product or design must be viewed through a prism of its impact on people, systems, and the environment. The impacts could be unexpected and undesirable, becoming apparent only after implementation of the new technology in society” (Loveland & Dunn, 2014, p. 16).

The students would work in their team (collaborate) to brainstorm (creativity) a design (systems thinking) to solve (optimism) the challenge, accounting for the production cycle waste (ethics) of their material choices and presenting their findings (communicate) to the class. The instructor could construct a performance-based rubric to assess these engineering habits of mind to provide feedback to the students. (p. 16)

By emphasizing the engineering habits of mind with students as they are preparing to become engineers, educators can assist them in moving forward into college and into their careers (Loveland & Dunn, 2014).

Mathematics

Charbonneau et al. (2009) defined the key habits of mind to be “creativity, work ethic, thinking interdependently, critical thinking, lifelong learning, and curiosity . . . for all of the mathematics programs in the Department of Mathematical Sciences at the United States Military Academy (USMA) at West Point” (p. 105). According to the authors, “A major reason that we . . . are focusing on developing habits of mind is so that we can better accomplish our institution’s overarching goal in its intellectual domain” (p. 106). “We as instructors must realize that there is more to our mathematics class than, for example, learning about the derivative and other calculus topics” (p. 106).

Because the amount of knowledge available to us is growing exponentially, we strongly believe that it is no longer enough to simply teach a base of knowledge, some of which may be outdated by the time our students graduate. They should have the ability to access the vast amount of existing knowledge so that they will be empowered the rest of their lives to continue to develop intellectually. (p. 106)

Charbonneau et al. (2009) provided strategies and principles for teaching the habits of mind of creativity, work ethic, thinking interdependently, critical thinking, lifelong learning, and curiosity in the mathematics classroom at the college level.

Gordon (2011) proposed habits of mind for mathematics students at the college level.

The classroom conversation needs to include discussion of the actions mathematically able thinkers use to gain insight into a problem, such as: considering a simpler problem, tinkering, taking things apart” (Abstract).

We have to make the inquiry process an integral element of the curriculum content so that the productive practices of a mathematically inclined mind are made explicit, and promoted as worthy of study. . . . As educators we have a moral as well as a pedagogical obligation to help all our students develop further their capacity for thoughtful decision-making as it is essential for a life-enriching society. (p. 458).

Inasmuch as mathematical habits of mind promote more thoughtful, reflective, creative problem solvers, these would seem more than appropriate as belonging on the list of the very qualities we would seek to develop in students everywhere. (p. 459).

It would seem that were habits of mind incorporated in all classes, students as adults would be more inclined to participate constructively in their community’s decision making given the realistic confidence gained as productive participants in and shapers of their classroom community’s conversations and resolutions. (p. 467).

Science

Liftig (2009) provided an introduction to an edition of Science Scope that was focused on habits of mind related to science.

Science process skills and content knowledge are not enough to produce the scientists and scientifically literate citizens we need in the 21st century. Shared values and dispositions within the science community such as curiosity, honesty, openness, and skepticism must also be nurtured, modeled, and practiced continuously in science classrooms at all levels until they become deeply entrenched and respected “habits of mind.” (p. 1).

Hayes, Smith, and Eick (2005) suggested that science teachers should employ habits of mind to help students to avoid accidents before they engage in a laboratory experience, during the experience, and after they have had the experience. “Cultivating . . . ‘habits of mind’ at each stage of laboratory work is the first big step toward achieving safety in the laboratory setting” (p. 24). The authors suggested that science teachers should provide students with safety rules, instruct the students in using the rules, and keep a record of student attendance at the instructional sessions. They proposed guidelines for students and suggested clothing for students to wear, procedures for handling accidents, guidelines for working with chemicals, cautions for working with equipment, and procedures for using heat. They provided a safety contract for students to sign, and they suggested strategies for keeping students safe while the students are involved in the lab experience and after they have completed it.

Wieder (2006) discussed the importance of science teachers using the history of science as a teaching tool to help students to internalize the habits of mind that the scientists had displayed, motivate students, help the field of science to be more human, and help students to

understand the scientific concepts more thoroughly. He explained a unit in which he had told the story of how scientists had discovered DNA. He observed the students thinking flexibly as they engaged in their subsequent lab experiences. In addition, they were motivated to learn and explore. According to Wieder, “Shifting curricula to commit to teaching science as a story. . . implicitly centers science education on the habits of mind outlined by Costa and Kallick” (p. 203).

Writing

The *Council of Writing Program Administrators* (2011) identified eight habits of mind essential for success in college writing:

- Curiosity—the desire to know more about the world.
- Openness—the willingness to consider new ways of being and thinking in the world.
- Engagement—a sense of investment and involvement in learning.
- Creativity—the ability to use novel approaches for generating, investigating, and representing ideas.
- Persistence—the ability to sustain interest in and attention to short- and long-term projects.
- Responsibility—the ability to take ownership of one’s actions and understand the consequences of those actions for oneself and others.
- Flexibility—the ability to adapt to situations, expectations, or demands.
- Metacognition—the ability to reflect on one’s own thinking as well as on the individual and cultural processes used to structure knowledge. (para. 3)

Sullivan (2012) wrote about habits of mind that are essential to prepare students for college. In commenting on the *Framework for Success in Postsecondary Writing* (Council of Writing Program Administrators, 2011), he suggested that “these qualities are much more vital to college success than, say, target SAT scores or recommended high school course sequences or even rhetorical knowledge and knowledge of writing conventions” (p. 547). He expressed pleasure that the Council had included the habits of mind of “engagement, responsibility, and persistence” (p. 549). He suggested the addition of “humility” (p. 550). He concluded, “Overall, I would like to see high school students begin to think about college readiness in ways that focus not on test scores or particular curricular achievements and skill sets, but on dispositional qualities and character traits” (p. 550).

K. Johnson (2013) also discussed the *Framework for Success in Postsecondary Writing* (Council of Writing Program Administrators, 2011), which “defined college readiness not in terms of standards but in terms of intellectual behaviors and educational experiences” (p. 517). According to Johnson, the *Framework* suggested that “through experiences with reading, writing, and critical analysis, . . . teachers may help students foster eight habits of mind—curiosity, openness, engagement, creativity, persistence, responsibility, flexibility, and metacognition—that will position them for success in college writing courses, in multiple academic disciplines, and in the workplace” (p. 518). According to Johnson, “Through its focus on habits of mind, the *Framework* reframes a widespread public narrative about written products and quantified achievements with an alternate narrative about writers and their development” (p. 518). She added, “The *Framework* encourages scholars in rhetoric and composition to claim the reality that writing instruction inherently teaches students ways of being in the world” (p. 536).

RESEARCH AND ARTICLES ON THE HABITS OF MIND (COSTA & KALICK, 2000)

Researchers have conducted studies on Costa and Kallick’s (2000) Habits of Mind in a variety of settings. They have investigated the theories behind the Habits of Mind, and they have studied the Habits of Mind with elementary students, secondary students, teachers, librarians, university students, and prison inmates.

Theories Behind the Habits of Mind

Campbell (n.d.) explored possible theoretical bases behind the Habits of Mind (Costa & Kallick, 2000). According to Campbell, theories related to the nature of intelligence can be associated with the Habits of Mind, such as “*Metacognition, Striving for Accuracy, Thinking Flexibly and Creating, Imagining and Innovating*” (p. 5, italics in the original). Reflective thinking is related to “Habits of Mind such as *Applying Past Knowledge to New Situations, Striving for Accuracy, Gathering Data through all Senses and Metacognition*” (p. 5, italics in original). Mindfulness is related to “*Metacognition and Thinking Flexibly*” (p. 5, italics in original). In addition, Habits of Mind such as *Applying Past Knowledge to New Situations, Gathering Data through all Senses* and *Thinking and Communicating with Clarity and Precision* implicitly include the concept of sensory perception and memory” (p. 6, italics in original). Campbell explained,

Information storage begins at the point of *Gathering Data Through all our Senses*, when we receive stimuli from the environment through our natural pathways before our brain processes the stimuli and stores the information in a meaningful way. When we use the Habit of Mind, *Applying Past Knowledge to New Situations*, we need to be able to retrieve information from our brain’s memory compartments to use this information in a different context (e.g., recalling our multiplication tables when planning the dimensions of a house extension). In this way information is recalled and processed into meaningful knowledge. In turn, then, this meaningful knowledge can assist learners to *Think and Communicate with Clarity and Precision*. (p. 7, italics in original)

Campbell (n.d.) explained the relationship between cognitive styles and the Habits of Mind:

It can be argued that each of the sixteen Habits of Mind is informed by Cognitive Style theory, but *Managing Impulsivity*, *Striving for Accuracy*, *Metacognition*, *Responding with Wonderment and Awe*, *Questioning and Posing Problems*, *Applying Past Knowledge to New Situations*, and *Thinking Interdependently* are more explicitly informed by work in this area. (p. 8, italics in original)

Managing Impulsivity involves thoughtful and deliberate planning before deciding upon our actions, and *Striving for Accuracy* includes the concepts of checking our work and setting high standards for its completion. Reflective thinking is generally regarded as being synonymous with metacognitive strategies. (p. 8, italics in original)

Campbell (n.d.) explained how some of the Habits of Mind are consistent with constructivist theory:

The principles of constructivism parallel Habits of Mind such as *Metacognition*, *Thinking Interdependently*, *Questioning and Posing Problems*, *Managing Impulsivity* and *Gathering Data through all Senses*. Firstly, as learners construct their own meanings of their world, they employ metacognitive strategies such as reflection, planning and evaluation, as well as data-gathering processes through their five senses. Secondly, social interaction provides opportunities for learners to clarify their thought processes and learn from others in reciprocal situations. Finally, a questioning attitude serves the learner in terms of meaning-making and solving problems. (p. 9, italics in original)

Campbell (n.d.) also discussed the relationship between some of the Habits of Mind (Costa & Kallick, 2000) and social learning theory.

Managing Impulsivity and Metacognition include the concepts of self-talk and self-regulation of behaviors, while *Gathering Data through all Senses* comprises observational skills and learning from others. *Thinking and Communicating with Clarity and Precision* incorporates language as the key communicative tool and the means of clarifying the learner's ideas and thoughts. (pp. 9-10, italics in original)

According to Campbell (n.d.), some of Costa and Kallick's (2000) Habits of Mind are associated with emotional intelligence:

The Habits of Mind, *Persisting*, *Managing Impulsivity*, *Listening with Understanding and Empathy*, *Finding Humour* and *Responding with Wonderment and Awe*, incorporate recognition of the significance of emotions within the learning process. For example, it makes intuitive sense that empathy for another person requires some skills in reading emotional cues, and that laughing at oneself and the world is closely related to one's emotions. Additionally, it also makes intuitive sense that persisting and managing impulsivity presupposes an ability to manage one's emotional responses. (p. 10, italics in original)

Campbell (n.d.) also explained the relationship between five premises of brain development and Costa and Kallick's (2000) Habits of Mind. According to Campbell, when people learn, the brain changes physically, resulting in new wiring. This suggests that people can change their brains through learning. "This premise coincides neatly with the Habits of Mind, *Remaining Open to Continuous Learning* and *Taking Responsible Risks*, whereby learners try new and different challenges in efforts to gain increased knowledge, skills and wisdom" (p. 10). In addition, when people learn, the brain becomes organized in new and different ways (Campbell, n.d.), suggesting the importance of learners having numerous sensory experiences. This is related to *Gathering Data through All Senses*. Campbell suggested that learning involves making connections with experiences, which builds stronger memory. This goes with the Habit of Mind of *Applying Past Knowledge in New Situations*. Next, Campbell (n.d.) discussed the importance of learners processing multiple sources of input, which is aligned with *Gathering Data through All Senses*. Finally, Campbell talked about the relationship between emotions and thinking. When learners feel good while they are learning, they tend to be more motivated and focused.

This final premise relates directly to *Metacognition* and *Listening with Understanding and Empathy*, whereby learners seek increased awareness of the meaning of their own emotions and make efforts to understand the emotions of others. This greater understanding of emotional meaning may be enhanced through metacognitive strategies such as the monitoring of emotional cues, and reflective thinking based on appropriate questions, as well as the reading of verbal and non-verbal cues of others. (pp. 11-12)

These general influences upon HoM [Habits of Mind], in turn, may be seen to have implicit or less direct impact upon vocational, relational and academic performance. Cognitive learning theory (including constructivism), social learning theory, brain research and theories on the nature of intelligence (including emotional intelligence) may, however, directly influence the HoM displayed in the classroom, as well as the learners' attitudes and perceptions and the learning environment itself. I propose that it is these three latter dimensions within the schooling context that have the most explicit influence upon vocational, relational and academic performance. (pp. 12-13)

Carey (2007) suggested that Costa and Kallick's (2000) Habits of Mind are closely aligned with the Montessori way of teaching.

Montessori recognized that there is no uniform method, no set of guidelines for teaching because learners are individuals, who bring to the classroom different experiences, attitudes, and values, and whose path of self-development is singular. Education as the development of the body and mind is useless unless the soul is awakened (p. 4).

Use of the Habits of Mind With Elementary Students

According to *Tabor, Brace, Lawrence, and Latti* (2008), Waikiki Elementary School has been using the Habits of Mind for more than 20 years. Faculty and students, as well as people in the community, have incorporated the Habits of Mind into everything they do. They explained how they had created a “mindful culture” (p. 348) by implementing the Habits of Mind. “Waikiki School students are prepared to perform well on the tests of life” (p. 360). Teachers model the Habits of Mind for the students, and “this school culture results in a dynamic learning community in which all participants are challenged to become ever more mindful, ever more thoughtful learners to support the collective efforts of the school” (p. 360).

Waikiki School serves 391 students from kindergarten through grade 6. More than 50 percent of the students live outside the school’s boundaries and attend by choice. Its draw may be its unique curriculum, which couples instruction in the Hawaii State Content Standards with instruction in the Habits of Mind. Using research to identify the behaviors associated with effective adults, we emphasize the explicit teaching of these behaviors to all students in the school. The infusion of this model within standards-based instruction defines the strength of Waikiki School.

In 2007-08, 40 percent of the students qualified for the free/reduced [price] lunch program, 38 percent for English Language Learner (ELL) assistance, and 10 percent for special education services; and 40 percent lived in single-parent homes. Despite the intensity of student needs, our school continues to exceed all national and state standards, making consistent yearly gains. Waikiki has been recognized as a Hawaii Distinguished School, attaining adequate yearly progress (AYP) each year since the inception of this award. We have consistently been rated in “Good Standing—Unconditional” under the No Child Left Behind Act and have consistently made the state’s Stanford Achievement Test Honor Roll. Waikiki advanced to become a Blue Ribbon School by 1995 and a National Blue Ribbon recipient in 2007. In a survey of Hawaii’s best schools in *Honolulu Magazine’s* May 2008 issue, Waikiki School was given an A+ based on test scores and desirability, and was ranked fifth of 258 schools. (p. 350)

In a letter to Dr. Arthur Costa in 2013, Tabor reported:

Waikiki Elementary, a Mindful School, on the slopes of Diamond Head Crater in Honolulu, has embraced the Habits of Mind for over 20 years. The results have been remarkable. More than instructional strategies, the Habits of Mind are infused into the organizational norms and are shared by the instructional and support staff, the students and the community—they live the Habits of Mind. They have endured through three changes in principals and numerous new additions to the faculty. Waikiki Elementary was one of three schools selected as a 2013 Hawaii Blue Ribbon School and has gone on to be awarded the title of a 2013 National Blue Ribbon School. These achievements are a result of consistent state proficiency test scores in the top 10 percent while serving a student population with 38% economically disadvantaged, 30% English language learners, and 40% from nontraditional families. On school quality surveys, parent satisfaction measures are a whopping 94.4%. On *Honolulu Magazine's* yearly school ranking, Waikiki School has consistently placed in the top 5 out of 267 state public schools, receiving an overall grade of A+. Additionally, on October 25, 2013, Waikiki School was honored by having one of its teachers selected as the 2013 State Teacher of the Year. (B. Tabor, personal communication, October 5, 2013)

According to a report to the Accrediting Commission for Schools in 2014,

Despite the intensity and diversity of student needs, the school continues to exceed all national and state standards, scoring in the state's top 2% in both reading and math for the past three years. Longitudinal data indicate a consistent pattern of high student growth and high achievement. Waikiki has consistently attained a status of "Unconditional Good Standing." In 2013, Waikiki School was ranked third of 255 schools in Honolulu Magazine's survey of Hawaii's best public schools.

In addition to the tests they take at school, Waikiki School students are prepared to perform well on the tests of life. Teachers and staff don't simply teach values or mindful habits; they model the behaviors they want to see developed. This results in a dynamic learning community in which all participants are challenged to become ever more mindful, more thoughtful, life-long learners to support the collective efforts of the school. (p. 2)

In addition, "The state's 2013 School Quality Survey (SQS) had an incredible 100% of the teachers say they were satisfied with the school and 94.4% of the parents saying they were satisfied as well" (Accrediting Commission for Schools, 2014, p. 3).

Waikiki's culture of positive family involvement and engagement has translated to high academic performance on high stakes testing despite being a school with 22% English Language Learners, 50% unable to meet K entrance readiness standards, 40% from single parent families, and almost 40% with family incomes below the poverty line. (Accrediting Commission for Schools, 2014, p. 3)

The accrediting agency wrote that, “Waikiki Elementary School is a remarkable learning institution for students—innovative, unique, and very successful in terms of student learning” (Accrediting Commission for Schools, 2014, p. 3).

According to the report,

Based on achievement scores on the HSAs, Waikiki students have consistently met or exceeded goals, showing steady improvement over time. An example of this is the six-year period between the school years of 2008 and 2013, when Waikiki School made outstanding gains with a 17% improvement in reading and 20% in math. These scores consistently exceeded state proficiency standards in 2013 by 16% in reading and 27% in math. (p. 3)

The Accrediting Commission for Schools (2014) said, “It is noted that all school stakeholders live the vision and statement, and it truly drives what happens at the school” (p. 6). With regard to the school culture, the author observed,

Beyond academics, the school focus is about helping students think about their actions—a focus on their whole character. The school’s philosophy is about embodying awareness internally and externally—more than just focusing on cognitive development. The school staff emphasizes with students how to live their lives. There is an explicit focus on the whole child. Staff works with the whole family unit. School has a culture—Habits of Mind, and there is a conscious, intentional effort to live the Vision and Mission. Teachers are responsive to students and their family needs. Everyone is cheerful and on board. Everyone is on the same page. The school climate is described by all stakeholders as open and welcoming. (p. 9)

In summary, the Chair of the visit reported:

The Initial Visit chairperson in his 40 years of experience in public education has never been to a school where clearly everyone is “on the same page.” This commitment contributes greater to a culture and climate of student learning and achievement but not just in the cognitive areas. The concept of Mindful Education is actually translated into practice schoolwide and understood by all, including parents and their children. The culture has a tremendous impact on what happens with curriculum and instruction. Culture impacts what happens educationally, not the other way around. (Accrediting Commission for Schools, 2014, p. 11)

In closing, the Chair called the school “a truly unique and impressive school” (p. 12).

Burgess (2012) included 15 children from ages 7 to 12, their teachers, and their parents in a study to determine whether their exposure to eight of the Habits of Mind would change their behavior. The principal selected the children and staff to participate in the study because the children had “challenging behaviors” (p. 52). They were also selected based on the Conners Teacher Rating Scale (Conners, 1997). Burgess administered the Intelligent Behaviors Scale (IBS; Costa & Kallick, 2005) and the Conners Teacher Rating Scale—Revised (CRS-R; Conners, 1997). She also used semistructured interviews to gather data. She found that the children increased the most on Persisting (48%), followed by Applying Past Knowledge to New Situations (39%), Listening with Understanding and Empathy (37%), Managing Impulsivity (35%), Thinking Flexibly (32%), Striving for Accuracy (22%), Taking Responsible Risks (13%), and Thinking and Communicating with Clarity and Precision (12%). While students, teachers, and parents commented on all eight of the Habits of Mind in the interviews, they particularly mentioned Managing Impulsivity, Risk-taking, and Working with Others. “The students felt they had changed more significantly than the change identified by the parents and teachers” (p. 58). The students reported that their peers were becoming more accepting of them, and they reported fewer instances of being “in trouble” (p. 58) with adults.

When comparing behavior improvement measurements on a tool (CRS-R) that is designed to evaluate problem behaviors and ADHD behaviors as reported by teachers, there was also found to be a decline in problematic behavior in the areas of oppositional behaviors and ADHD index behaviors; in particular, a decline in difficulty playing or engaging in leisure activities quietly, a decline in spiteful or vindictive behaviors, an increase in attention span and reduced fidgeting with hands or feet or squirming in seat. (p. 59)

Two teachers who participated in the interviews attributed these results to the students’ increase in “listening with understanding and empathy, seeking to understand others first” (Burgess, 2012, p. 59).

Bee, Seng, and Jusoff (2013) examined how students in an English as a Second Language (ESL) class in Malaysia used the Habits of Mind as they worked together in reading collaboratively. Four boys and two girls who were 12 years old participated in the study. They had been learning to speak English since Year 1 and were in Year 6 at the time of the study.

The students participated in five sessions of reading (Bee et al., 2013). They faced each other and silently read texts in English that were on their level (Level 5 or 6). Then, each student selected a question from an envelope to answer. After each student read the question aloud and answered it, all of the students discussed the question. The researchers recorded the sessions using audio and video equipment. They also took field notes and used a checklist of the Habits of Mind. The students participated in a focus group after they had engaged in the five sessions.

The students engaged in almost all the HoM . . . as they interacted during the collaborative reading sessions. For instance, the students were seen rereading the texts, pausing to think at intervals, attempting to state their points clearly, seeking clarification and trying to find the best answer to the questions posed. (Bee et al., 2013, p. 132)

Bee et al. (2013) observed 650 incidents of the students using Habits of Mind. The students most frequently used Questioning and Posing Problems (17.0%), Thinking and Communicating with Clarity and Precision (14.3%), and Applying Past Knowledge to New Situations (13.1%).

The HoM were employed in “clusters” whereby a few HoM would be frequently observed together. For instance, through the employment of “HoM7: Questioning and posing problems,” the students activated their prior knowledge “HoM8: Applying past knowledge to new situations” in finding more information to support their understanding, to elaborate on their thoughts or to overcome uncertainties. Furthermore, throughout the ensuing discussions they would employ “HoM9: Thinking and communicating with clarity and precision” and “HoM3: Listening with understanding and empathy” as they sought to make sense of the text. (Bee et al., 2013, p. 134)

Bee et al. (2013) also identified a new Habit of Mind—Predicting. They found that the students made predictions “when they were faced with difficulties in finding solutions” (p. 135).

Strickland (2005) reported on students’ use of the Habits of Mind at Hendricks Day School in Jacksonville, FL.

History students, for example, might talk about what habits George Washington displayed when he led the Continental Army to victory. In math, the habits come into play when students are asked how they arrived at a solution. And when dissecting a novel in an English class, they talk about what habits characters employed in making decisions. (para. 9)

Joey Altomare, 13, said he’s used the habits to get better grades, sharpen his soccer skills and help his younger brother with his homework. “It helps me put everything in categories,” he said. (paras. 10-11)

Tanya Elstein, a second-grade teacher, described it as a lifelong habit that “you take with you to help you make better decisions.” (para. 12)

Use of the Habits of Mind with Secondary Students

Chang et al. (2011) conducted a study to determine the relationship between the Habits of Mind and violence risk, success in academics, and number of suspensions from school among Asian and Pacific Islander students. The Habits of Mind Inventory (HoMI) was developed by Dr. Earl S. Hishinuma from the Asian/Pacific Islander Youth Violence Prevention Center (API-YVPC); Francine Honda, who was the principal of Kailua High School (KHS); and Dr. Arthur L. Costa from the Habits of Mind Institute. The survey contained 75 items, including 6 items related to demographics, 17 items related to constructs that were similar to the Habits of Mind, 49 items to measure the 16 Habits of Mind, and 3 items to measure degree to which the students understood the philosophy behind the Habits of Mind. Cronbach's alpha was .67 for the instrument overall. Cronbach's alpha for the 16 subscales ranged from .57 for Taking Responsible Risks to .86 for Thinking Interdependently. Cronbach's alphas for 13 of the 16 subscales were above .73. According to the authors,

The Kailua High School students surveyed during fall and spring of 2009-2010 academic years reported significant changes on select Habits of Mind items and other constructs. The students reported a significant increase in their belief that they could solve their own problems and that what happens to them is their "own doing." They reported greater habits of empathy by listening well to other people and thinking of other people's thoughts and ideas. However, not unexpectedly given adolescent development, the students also reported greater risk behaviors, such as using substances like marijuana and alcohol, as well as a perception of being both perpetrators and victims of violence. In terms of social support, the students reported a significant decrease in their emotional reliance on family. There were also increases in gathering information through all senses, and in liking to find humor in things. Overall, the students reported liking and feeling more confident in their Habits of Mind abilities towards the end of the academic year. (p. 4)

Based on the 2008-2009 school year data, overall, boys and Hawaiian adolescents self-reported higher rates of violence risk. All except questioning/problem solving and taking responsible risks were significantly and negatively associated with violence risk. However, the protective factors that were uniquely and negatively associated with violence risk were persistence, thinking interdependently, and managing impulsivity. Questioning/problem solving was uniquely associated with violence risk in a positive way; this may be reflective of the wording of the subscale (e.g., "I have a questioning attitude"). The overall simultaneous, multiple regression models accounted for 16% of the variance in violence risk ($p < .001$). (pp. 4-5)

The 2005-2006 data indicated that all 16 HoM negatively correlated with a measure of overall well-being, with correlations ranging from .31-.57. In addition, the HoMI items were generally associated with the 17 risk-protective items and academic achievement measures as expected (e.g., grade-point averages [GPAs], Hawai'i State Assessment [reading & mathematics]). For example, there was a negative correlation between HoM,

managing impulsivity with substance use, acting violently toward others, and being a victim of violence. (p. 5)

Based on the 2007-2008 and 2008-2009 school years, factors such as persisting, striving for accuracy, finding humor, learning with understanding, and empathy were all characteristics of successful students (i.e., higher GPA, less [sic] suspensions). The more risk factors a student had, the lower their GPA and greater likelihood that they were suspended.

However, resilience may have accounted for students who continued to be at risk but improved in school. Persisting was consistently associated with higher GPA and fewer suspensions. (p. 5)

Marshall (2004) investigated the outcomes of 16 students in a Precalculus course receiving 5 months of instruction in the Habits of Mind that he integrated into their lessons. Students took pre/post surveys, wrote in their journals about the Habits of Mind, and participated in a focus group. The students grew the most from pretest to posttest on Questioning and Using Past Knowledge and Experience, yet not significantly. Students grew from pretest to posttest on 9 of the 12 Habits of Mind on which they had received instruction. On the posttest, the females showed significantly higher persistence than the males ($p = .019$). In the focus groups, the most students indicated that they were aware of Using Past Knowledge and Experience ($n = 5$), followed by Persistence ($n = 3$), Wonderment ($n = 3$), and Metacognition ($n = 2$). The most students reported that they had changed in Checking for Accuracy ($n = 4$) and Managing Impulsivity ($n = 3$), followed by Persistence ($n = 2$), Wonderment ($n = 2$), and Precision of Language and Thought ($n = 2$). When asked how they might use the Habits of Mind in the future, the most frequently mentioned Habits of Mind were Managing Impulsivity ($n = 3$) and Using Past Knowledge and Experience ($n = 2$). Some of the students indicated that the Habits of Mind would assist them in becoming successful. Students suggested that the Habits of Mind would assist them in “jobs, efficiency in school work, setting goals, having a good future, being a better worker, making others happy, respecting others, and being a better person” (p. 38). In response to the open-ended survey question, the most students wrote about Drawing on Past Knowledge and Experiences ($n = 8$), followed by Managing Impulsivity ($n = 7$), Persisting ($n = 6$), Checking for Accuracy ($n = 5$), and Wonderment ($n = 5$).

Matsuoka (2007) conducted a study to determine whether students' use of the Habits of Mind and participation in Philosophy for Children Hawai'i when they were in elementary school would continue to influence their *thinking* process when they were in middle school. She was investigating whether they had internalized the concepts that they had learned from participating in the two programs. She conducted seven focus groups with 8 middle school students. The students wrote in their journals for 15 minutes after each interview. Then, she conducted in-depth interviews with 3 students, along with their parents and middle school teachers. "The students . . . demonstrated that they had, to some extent, internalized the vocabulary and thinking process of Habits of the Mind and Philosophy for Children Hawai'i through their rationalizations and deliberations" (p. 191, italics in original). Furthermore, "When faced with difficult choices or situations, these students used Habits of the Mind and Philosophy for Children Hawai'i to think critically, solve problems, and make informed decisions" (pp. 259-260). The students "had a repertoire of problem-solving strategies to rely on in challenging situations" (p. 260). In addition, "There was evidence that the students had retained a knowledge and understanding of the language" (p. 260).

Shaeffer et al. (2014) studied students of three high school science teachers who specifically taught the Habits of Mind of Thinking Interdependently and Persistence during the 2014 spring semester in two to five lessons in 4 weeks. The teachers selected eight Habits of Mind to survey both before and after instruction, created a rubric to measure the two Habits of Mind on which the teachers were focusing, participated in interviews at the end of the intervention, were observed in the classroom, wrote in journals about their two strongest Habits of Mind and the two that they felt that they needed to work on, and produced a video on one of the Habits of Mind. The researchers wanted to find out "whether explicit instruction in the HoM would increase metacognition, improve collaboration and develop other traits that have proven necessary for success in school and in life" (p. 2).

The general survey scores for all eight Habits of Mind introduced to students showed a decrease in self-reported effective use of HoM. This contrasts with the results seen for the two specific HoM for which explicit instruction was given (Thinking Interdependently and Persistence). The negative growth seen in the overall scores could be explained by an increase in the students' awareness of the Habits of Mind, possibly leading to a more critical examination of how well they employed these mental characteristics. (pp. 3-4)

Shaeffer et al. (2014) also found that the juniors and seniors in one of the classes grew more from pretest to posttest in Thinking Interdependently than the freshmen and sophomores in the other two classes. The researchers suggested that the differences may have been based on the different ways in which the teachers had presented the materials, or the differences may have been due to the older students being more able to learn the material that was presented in a short period of time. They also suggested that the degree to which the students were committed to learning the Habits of Mind might have influenced the findings. The teachers "reported an improvement in cooperation and the sharing of ideas during lab group work" (p. 4) and wanted to continue using the Habits of Mind in the future.

Use of the Habits of Mind by Teachers and Librarians

Krisko (2001) explored the characteristics of formal and informal teacher leaders. She invited them to reply “to statements that revealed identifiable descriptors of characteristics or attributes of effective teacher leaders who lead beyond the classroom” (Abstract). According to Krisko, “The teacher leader profile identifies individuals who are creative, efficacious, flexible, and lifelong learners and who find humor, are willing to take responsible risks, and have good intrapersonal sense and strong interpersonal skills” (p. 12). She suggested that administrators could use the teacher leader profile to help both teachers and administrators “to identify the potential in an individual to assume leadership responsibilities” (p. 12).

Dvorak (2007) investigated the dispositions of teachers of gifted and talented students in a naturalistic inquiry study. She identified six teachers based on recommendations by administrators in three school districts. Two teachers taught at the elementary level, two taught at the middle school level, and two taught at the high school level. She interviewed the participants and observed them in the classroom.

Dvorak’s (2007) first research question was “What patterns of knowledge, skills, and dispositions characterized the actions and thoughts of gifted education teachers displaying reputational expertise?” (p. 97) Responses were as follows.

Observations and interviews provided numerous opportunities to see participants displaying dispositions associated with:

- Listening to others with understanding and empathy
- Creating, imagining and innovating through class experiences which fostered these skills, but rarely was truly gathering data through all senses included
- Thinking interdependently through group projects, learning together, teaching each other
- Developing thinking skills, but not necessarily metacognition, teaching students to think about their thinking
- Thinking flexibly but not necessarily finding humor

Less often depicted, but nonetheless present with some of the facilitators, were behaviors of:

- Persisting; managing impulsivity; taking responsible risks
- Striving for accuracy and precision; thinking and communicating with clarity and precision were present in inferences more than by explicit demonstration
- Metacognition, thinking about thinking

Most importantly, however, the distinguishing dispositions for the facilitators who displayed reputational expertise were those corresponding with responding with wonderment and awe and learning continuously. These facilitators shared excitement and passion for both teaching and their own learning, often seeking opportunities to learn as a way of invigorating their teaching. In addition, these facilitators were reflective, anxious for feedback, and wanted to improve their teaching skills. (p. 148)

In addition, those with reputational expertise valued the Habits of Mind, talked about their importance, used them with students, and shared their insights with their students (Dvorak, 2007).

Dvorak's (2007) second and third research questions were as follows.

2. How important were various G/T [gifted and talented] teacher knowledge, skills, and dispositions considered to be by G/T teachers, administrators, and special education directors? (p. 97)
3. What is the congruence between special education directors' choices of more/less distinguished G/T teachers and the actions and reflections of teachers displaying reputational expertise? (p. 97)

Based on survey responses, Dvorak (2007) found the following:

G/T teachers' knowledge, skills, and dispositions must be strong in complex thinking as well as being flexible with individuals, curriculum issues, and strategies for working with the students. Knowledge must be held in the nature and needs of G/T students, which includes affective needs and the overall field and realm of gifted education. Environments should be learner-centered and encompass respect, cognitive risk-taking, perspectives of others, and opportunities for creative expression. The teacher should be well prepared and organized, possess questioning skills, the ability to work with others, and be able to work with cultural differences. (pp. 166-167)

Within the classroom, and without exception, the G/T teachers who displayed characteristics that were most congruent with the extant literature were assessed as above average, or strong in all categories, on the surveys addressing research question three. Administrators generally appeared to believe these facilitators displayed the characteristics as well. In the researcher's findings, these facilitators easily articulated thoughts about their behaviors and dispositions and drew upon behaviors associated with:

- Learning continuously
- Reflecting on practices
- Desiring continuous improvement
- Being passionate about learning and teaching

Facilitators also valued these behaviors enough to teach them to their students. (p. 167)

Another interesting finding was the following:

While citations in the literature noted G/T teachers need to possess superior intelligence, none of the results in this study overwhelmingly supported that belief. The majority (53%) of the respondents on the electronic survey agreed somewhat; two of four administrators placed it in the above average strength, or the middle category; and four of the facilitators rated it in the middle category, and above average strength. (p. 167)

Owens (2012) investigated the process that teachers used in their Professional Learning Communities (PLCs) as they implemented the Habits of Mind in two schools (Costa & Kallick, 2000). According to Owens, “Key emphasis within the study was given to exploring their influence [the Habits of Mind] on everyday classroom practice, teacher learning and collaboration, school leadership and organizational improvement” in two schools for 6 years (p. 13). Owens studied three teachers in each of the schools, in addition to himself. He used participatory action research, case study, and self-study methodologies. Data included observations, journals, and interview transcripts as he sought to answer the following research question: “How do the characteristics of professional learning communities affect their everyday functioning and facilitate teacher learning in schools developing a thinking curriculum centered on the Habits of Mind?” (p. 16).

With regard to Professional Learning Communities, Owens (2012) found that

the characteristics of a PLC can effectively support professional learning and the implementation of the Habits of Mind in schools when these characteristics are enacted in practice. In particular, the research has clearly demonstrated the ways in which PLCs focused on study and implementation of the Habits of Mind can help teachers develop the support and knowledge networks required for them to meet the challenges associated with deep pedagogical change. However, the study has also shown that the power of a PLC to promote deep learning and collaboration to sustain such a focus in school requires deep commitment from all levels of a school to the work of the PLC for ongoing growth and improvement. Similarly, while collaboration in these PLCs was shown to promote shared vision and mission amongst the participating teachers through the development of effective systems for learning in these schools, wider engagement with systems thinking is required if we hope to sustain these types of dynamic learning environments for teachers. (p. 273)

With regard to the Habits of Mind,

The study has found the Habits of Mind provided an effective and highly adaptable framework for the promotion of teacher understanding in relation to the development of effective learning dispositions in the schools involved in the study. The research has confirmed that the language and theory associated with the Habits of Mind supported the growth of teacher’s conceptual understanding about the development of effective learning dispositions, including deep consideration of the ways in which such a focus could be incorporated into their classroom practice. It was

particularly noticeable in the findings that the use of the Habits of Mind as a common language within the PLCs helped build a sense of collective vision and mission through the establishment of shared understandings. In this way, the Habits of Mind effectively helped the creation of a thinking curriculum focused on the development of effective learning dispositions, while also supporting the development of a highly thoughtful, supportive and collaborative culture within the school communities. (Owens, 2012, pp. 273-274)

Fontichiaro (2008) explained that in the changing world in which librarians live and work, they would benefit from using Costa and Kallick's (2000) Habits of Mind. According to Fontichiaro, "A series of behaviors must be identified that scaffolds and focuses our energies. For this, the Habits of Mind of Costa and Kallick poses a useful model. . . . These sixteen traits . . . serve as dispositions for library professionals, much as the AASL Standards outlines dispositions for students" (p. 57).

Just as Alice discovered, change and the unknown can be scary and magical at the same time. But these changes can be less scary when library media specialists realize that by committing to the certainty of change, the necessity of ongoing professional growth, and the development of Habits of Mind, the flexible toolkit needed to thrive is gained. (p. 58)

Use of the Habits of Mind by University Students

Hew and Cheung (2011) studied five habits of mind that university students displayed when facilitating online discussions. They examined data from asynchronous discussion forums in which students were finding problems with their colleagues' design projects, making suggestions for improvements, and responding to comments made by others. They examined data from 26 online discussion forums (12 with graduate students and 14 with nongraduate students who were earning a diploma). They conducted interviews with 15 participants. They found that the student facilitators most frequently used "is aware of own thinking" (metacognition), followed by "open-mindedness," "is accurate and seeks accuracy," "takes a position," and "sensitivity to others" (p. 280). The authors "found statistically significant differences at the 0.05 level of significance in the frequency of four habits of mind between the more frequent and the less frequent groups" (i.e., for all but sensitivity to others) (p. 281). They suggested that, "the habit of being accurate and seeking accuracy may help foster higher-level knowledge constructions because it helps participants to have a clearer picture of what the entire discussion is about" (p. 282). Furthermore, "Student facilitators who show open-mindedness can help create an inviting and respectful environment in their discussion forums" (p. 282). They concluded that, "facilitators who display the four habits of mind . . . more frequently may promote students' knowledge construction in their discussion forums" (p. 283).

McArthur (2011) used multiple-case study methodology to explore experiences of two doctoral students who were learning Discourse in a qualitative methods dissertation seminar, as well as the experiences of the professor. From the data, she identified "Scholarly Habits of Mind" (p. 166). She named them "Willingness to Take Risks" (p. 166; Taking Responsible Risks), "Willingness to Suspend Closure" (p. 168; Persisting), "Sustained Focused Attention" (p. 169), and "Accepting Criticism and Exploring Alternate Ideas" (p. 170; Thinking Flexibly). She also identified "Scholarly Dispositions" (p. 171), which included "Ability to Change" (p. 172), "Ability to Set Priorities" (p. 173), and "Ability to Overcome Limitations" (p. 176).

Use of the Habits of Mind with Prison Inmates

Houston (2009) and *Workforce Development Partnership* (2013) reported that the Community High School of Vermont used the Habits of Mind and placement in businesses with incarcerated men and women for 3 years.

Participants attend special classes in school (Habits of Mind) and then practice what they have learned in those classes in their housing using and correctional industries workplaces. This means that participants can practice the cognitive strategies they learn in class throughout the day, not just during their time in school. (Houston, 2009, p. 2)

According to Dana Lesperance, Vocational Education & Workforce Development Chief of the Community High School of Vermont,

[Participants who learn the 16 Habits of Mind] tend to pick 5 or so that really resonate and they start living them. The telltale sign is that you'll hear them use the phrase, "my Habits of Mind." It's no longer the Habits of Mind; it's *my* "Habits of Mind."

Speaking from a security officer's perspective, the program gives us a common language to use with offenders to address both positive and negative behavior. You can use the Habits of Mind to focus the discussion so it is meaningful and something productive comes out of it. (as cited in Houston, 2009, p. 5)

Three years of using the Habits of Mind with both male and female offenders resulted in the following outcomes:

Participants are significantly less likely to return to prison

- 59% of the male participants were reincarcerated within six months, as compared to 74% of the control population—representing a 20% reduction in recidivism
- 38% of the female participants were reincarcerated within six months, as compared to 63% of the control population—representing a 40% reduction in recidivism

Participants are more likely to acquire and retain employment

- 91% of the male participants found employment within a month, as compared to 64% of the control population—and 95% of those participants retained employment, compared to 86% of the control population
- 92% of the female participants found employment within a month, as compared to 86% of the control population—and 92% of those participants retained employment, compared to 75% of the control population. (Workforce Development Partnership, 2013, para. 1)

A graduate of the program reported:

The first Habit of Mind that I used was taking a responsible risk. I began to apply for jobs despite my fear of rejection. Other Habits of Mind that came into play were applying past knowledge to new situations (knowing myself and also knowing how to apply for jobs), thinking about thinking (noticing that I was making decisions out of fear), and thinking flexibly (being open to different types of work that might fit my situation). (as cited in Houston, 2009, p. 6)

The degree to which the participants learned the Habits of Mind was also measured. Houston (2009) reported the following:

Ninety-three percent of the male participants showed an increase in the acquisition of the Habits of Mind, whereas only 73 percent of the comparison group showed such an increase; for female inmates, the numbers were 96 percent and 63 percent, respectively. A relatively high number of comparison group members also showed increased acquisition of the Habits of Mind because many of these inmates were exposed to the Habits of Mind through association with participants in the Workforce Development Program group. (p. 6)

The Department of Corrections staff also participated in the study. According to Houston (2009),

Self-reports from correctional professionals engaged in the Workforce Development Program indicated that the program had the desired effect of promoting a positive organizational culture; however, the more formal aspects of culture (such as basic personnel practices, operations, and the allocation of resources) did not change as anticipated.

The changes that occurred did so with some difficulty. DOC staff and some of the industries staff struggled with the more interactive role that was required of them; however, they reported a significant increase in their job satisfaction. When asked how much their jobs have improved based on participation in the program, staff provided the following responses:

- Fifty percent reported greater job satisfaction.
- Forty-six percent reported being more effective at their jobs.
- Forty-two percent reported having a more positive attitude toward their jobs.
- With respect to communication, staff gave the following responses:
 - Seventy-one percent reported a greater ability to communicate with inmates.
 - Thirty-three percent reported a greater ability to communicate with other staff.
 - Thirty-three percent reported a greater ability to communicate with administration officials. (p. 6)

Houston (2009) concluded,

Most importantly, the Department of Corrections administration is slowly becoming aware of the fact that the Workforce Development Program is actually not a program at all. It's a different way of doing business that is slowly finding its way into other parts of the DOC operation. (p. 6)

According to Houston (2009), other jurisdictions can obtain their supervision manual to replicate the program.

References

- Accrediting Commission for Schools. (2014). *Initial visit: Hawaii Elementary Schools visiting committee report*. Burlingame, CA: Accrediting Commission for Schools.
- Bee, M. S. H., Seng, G. H., & Jusoff, K. (2013). Habits of mind in the ESL classroom. *English Language Teaching*, 6(11), 130-138. doi:10.5539/elt.v6n11p130
- Boyer, E. L. (1987). *College: The undergraduate experience in America*. New York, NY: Harper & Row.
- Burgess, J. (2012). The impact of teaching thinking skills as habits of mind to young children with challenging behaviors. *Emotional and Behavioral Difficulties*, 17(1), 47-63. doi:org/10.1080/13632752.2012.652426
- Campbell, J. (n.d.). *Theorizing Habits of Mind as a framework for learning* (Report No. CAM06102). Rockhampton, QLD, Australia: Central Queensland University.
- Carey, K. (2007). *The good teacher*. *Montessori Life*, 19(3), 4-5.
- Chang, J. Y., Bautista, R., Filibeck, K. M., Wong, S. S., Nishimura, S., & Hishinuma, E. S. (2011). *Kailua High School Habits of Mind inventory, 2005-2010*. Manoa, HI: University of Hawai'i at Manoa, Department of Psychiatry, Asian/Pacific Islander Youth Violence Prevention Center (APIYVPC).
- Charbonneau, P. C., Jackson, H. A., Kobylski, G. C., Roginski, J. W., Sulewski, C. A., & Wattenberg, F. (2009). Developing students' "Habits of Mind" in a mathematics program. *PRIMUS*, 19(2), 105-126. doi:10.1080/10511970802409040
- Claxton, G., Chambers, M., Powell, G., & Lucas, B. (2011). *The learning powered school: Pioneering 21st-century education*. Bristol, UK: TLO Limited.
- Conley, D. T. (2013, Jan. 22). Rethinking the notion of 'noncognitive.' *Education Week*. Retrieved from <http://www.edweek.org/we/articles/2013/01/23/18conley.h32/html>
- Conners, C. K. (1997). *Conners' Teachers Rating Scale—Revised (S)*. North Tonawanda, NY: Multi-Health Systems.
- Costa, A. L., & Kallick, B. (2000). *Discovering and exploring Habits of Mind*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Council of Writing Program Administrators. (2011). *Framework for success in postsecondary writing*. Retrieved from <http://wpacouncil.org/files/framework-for-success-postsecondary-writing.pdf>
- Dottin, E. S. (2009). Professional judgment and dispositions in teacher education. *Teaching and Teacher Education*, 25, 83-88. doi:10.1016/j.tate.2008.06.005
- Dvorak, M. J. (2007). *Gifted education teachers: Knowledge, skills, and dispositions in thought and action* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses (UMI No. 4384271)
- Ennis, R. H. (1996). Critical thinking dispositions: Their nature and assessability. *Informal Logic*, 18(2-3), 165-182.
- Fletcher, J. (2013, Winter). Critical habits of mind: Exposing the process of development. *Liberal Education*, 50-55.

- Fontichiaro, K. (2008). Dancing down the rabbit hole: Habits of Mind for embracing change. *School Library Media Activities Monthly*, 25(3), 56-58.
- Gordon, M. (2011). Mathematical habits of mind: Promoting students' thoughtful considerations. *Journal of Curriculum Studies*, 43, 457-469. doi:10.1080/00220272.2011.578664
- Hayes, L., Smith, M., & Eick, C. (2005). Habits of Mind for the science laboratory. *The Science Teacher*, 72(6), 24-29.
- Heick, T. (2013). *Shift learning: The 7 most powerful idea shifts in learning today*. Retrieved from <http://classroom-aid.com/2013/03/11/the-7-powerful-idea-shifts-in-learning-today/>
- Hew, K. F., & Cheung, W. S. (2011). Student facilitators' habits of mind and their influences on higher-level knowledge construction occurrences in online discussions: A case study. *Innovations in Education and Teaching International*, 48, 275-285. doi:10.1080/14703297.2011.593704
- Houston, M. C. (2009). *Creating a workforce development culture to reduce reincarceration*. Retrieved from <http://nicic.gov/library/023065>
- Johnson, D. (2006). Skills for the knowledge worker. *Teacher Librarian*, 34(1), 8-13.
- Johnson, K. (2013, February). Beyond standards: Disciplinary and national perspectives on habits of mind. *CCC*, 64, 517-541.
- Krisko, M. E. (2001). *Teacher leadership: A profile to identify the potential*. Paper presented at the Biennial Convocation of Kappa Delta Pi, Orlando, FL.
- Liffig, I. (2009). Nurturing scientific habits of mind. *Science Scope*, 33(1), 1.
- Loveland, T., & Dunn, D. (2014, May/June). Teaching engineering habits of mind in technology education. *Technology and Engineering Teacher*, 13-19.
- Lucas, B., Claxton, G., & Spencer, E. (2013). *Expansive education: Teaching learners for the real world*. Berkshire, UK: Open University Press.
- Marshall, A. R. (2004). *High school mathematics Habits of Mind instruction: Student growth and development* (Master's thesis). Retrieved from ProQuest Dissertations and Theses (UMI No. 1421654)
- Matsuoka, C. J. (2007). *Thinking processes in middle-school students: Looking at Habits of the Mind and philosophy for Children Hawai'i* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses (UMI No. 3302153)
- McArthur, D. L. (2011). *Scholarly capacities, habits of mind, and dispositions: Case studies of education doctoral students in a dissertation proposal seminar* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses (UMI No. 3484287)
- National Academy of Engineering. (2010). *Standards for K-12 engineering education?* Washington, DC: National Academies Press.
- Owens, R. (2012). *New schools of thought: Developing thinking and learning communities* (Unpublished doctoral dissertation). Monash University, Clayton, VIC, Australia.

- Pink, D. (2005). *A whole new mind: Moving from the information age to the conceptual age*. New York, NY: Riverhead Books.
- Shaeffer, J., Wong, F., O'Block, R., Locker, G., Eason, K., & Head, G. (2014). *Exploring Habits of Mind in the secondary science classroom*. Boulder, CO: University of Colorado Boulder.
- Sizer, T. R. (1992). *Horace's school: Redesigning the American high school*. New York, NY: Houghton Mifflin.
- Strickland, S. (2005, December 5). Thinking it through . . . critically; At Hendricks Day School, kids practice "Habits of Mind." (Jacksonville) *Florida Times-Union*, p. S-1.
- Sullivan, P. (2012). Essential habits of mind for college readiness. *College English*, 74, 547-553.
- Tabor, B., Brace, S., Lawrence, M., & Latti, A. (2008). The mindful culture of Waikiki Elementary School. In A. Costa & B. Kallick (Eds.), *Learning and leading with habits of mind: 16 Essential characteristics for success* (pp. 348-361). Alexandria, VA: ASCD.
- Taylor, S. H. (2011, November-December). Engendering habits of mind and heart through integrative learning. *About Campus*, 13-20. doi:10.1002/abc.20076
- Wieder, W. (2006). Science as story: Communicating the nature of science through historical perspectives on science. *The American Biology Teacher*, 68, 200-205.
- Workforce Development Partnership. (2013). *Workforce Development Partnership, Waterbury, VT, Community High School of Vermont*. Retrieved from <http://doc.vermont.gov/programs/educational-programs/workforce-development-partnership>
- Wurtzel, A. (2013), Habits of mind. *Leadership Excellence*, 30(1), 16.



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