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What David Perkins thinks about thinking may help to remake teaching in the next century. As codirector of the Graduate School of Education's Project Zero for the last 23 years, Perkins has lived on the cutting edge of educational theory.

But ask him where his ideas spring from, and Perkins will take you on a journey far from the creativity think tank that is Project Zero, back four decades and more to the little town of Farmington, Maine.

This is where Perkins grew up, learning to appreciate his uncle's landscape paintings, and the frames for those pictures that Perkins' own father fashioned by hand. Young Perkins also remembers his own efforts at art—he recalls now, at age 52, how much he once liked to draw monsters.

From such humble beginnings have grown Perkins' latest book, *The Intelligent Eye: Learning to Think by Looking at Art*.

What most people would expect, of course, is that Perkins' research draws much more on his education at M.I.T., where he earned a Ph.D. in mathematics and artificial intelligence. Most people would discount his grade-school proclivity for producing monster pictures. But that would not quite capture the essence of Perkins, an educator equally at home lecturing to government scientists at Los Alamos and NASA and conversing with the hometown barber. Perkins' work is deeply personal, including elements of high-plane intellectual and "aw, shucks." He has taken far-flung elements from his own life and used them to fashion theories that have deep significance for the study of learning.

David Perkins wants people to improve their thinking skills by studying art.
Perkins doesn't just appreciate the seeming disparity—he thrives on it. And that's the whole point behind The Intelligent Eye, in which Perkins offers the idea that we all can break out of established patterns and learn to think more creatively by looking critically at visual artworks. The same type of thinking strategies needed to appreciate a van Gogh painting can also help us to solve, for instance, mathematics problems, Perkins says.

**Taking Time To Think**

When asked whether his book—and his life—are made up of elements that don't seem at first to fit together, Perkins says, "Yes, it does seem somewhat disparate." Then he ponders. "I'm thinking about why it seems not so disparate to me. Let me reflect for just a bit here."

Perkins stops talking and stares inward. He mentions this technique again and again in his book, saying people need to "give thinking time." Finally, he says, "I guess one reason it seems not so disparate looks to another concern of mine, a concern of the nature of creativity.

"When you look at high-end creativity in any domain—across math, science, humanistic disciplines—similarities stand out that seem less apparent when one is looking at the work-a-day practice in that domain. What a journeyman artist does may not look that much like what a journeyman mathematician does. But what a very creative artist does structurally looks much more like what a very creative mathematician does.

"Creativity has to do with knowing where the boundaries are, and finding ways to subvert or transcend them." Perkins says there is another reason that one would not normally associate art with thinking—a feeling that art somehow just becomes, without a lot of thought going into it.

"Another part of it is that I think the arts have been saddled with a kind of romantic mystique that frames them as less cognitive than they are," Perkins says. But he points out that producing good art requires reflection and analysis—and so does good science.

"Good science involves flights of imagination like Einstein's famous 'ride on a light wave.' It involves sensitivities such as Darwin's vivid imagery about nature and how nature works. . . . It involves a lot of sensitive perception."

And then, after giving a very thoughtful and insightful answer, he shrugs and explodes into laughter. "Even so, this may all be post-hoc rationalization. I just may be that I like both of them [art and cognitive psychology], so I find ways in which to join them."

**Early Appreciation**

"When I was just an elementary school kid, like any other kid, I liked to draw," Perkins recalls. "I always liked to draw. I wouldn't draw anything great—monster pictures, rockets, things of that character."

Though the opportunity to appreciate art was scant in Farmington—"I doubt that I was inside a museum until some time in high school, say, and then perhaps only once or twice on visits to Boston"—Perkins indulged himself as best he could. Perkins played the piano, organ, and flute, and even did a little composing.

In high school, he discovered other art forms—poetry and literature in particular. He considered music and writing in addition to mathematics when it came time to pursue a course of college study.

"I was equally engaged in all those things, but it seems I was best at math,"

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Perkins Sees Art Appreciation as a Guide to Good Thinking

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In the 1970s, Perkins was pursuing studies in mathematics and artificial intelligence, while never forgetting his interest in the arts. While Perkins was still a graduate student, what was to become Project Zero was formed at Harvard, and Perkins became a founding member. In 1971, he became codirector, along with Howard Gardner.

Perkins describes Project Zero as a "think tank and SWAT team" because the project not only researches the nature of critical thinking and creativity, but also puts its ideas into practice through educational programs. Several of the projects have dealt with the intersection between thinking and the arts.

For Perkins, it was a perfect mix.

"Robert Frost has a line, something about making your avocation your vocation, and I think this was a case of that," he says.

Perkins has written books on thinking and education such as The Mind's Best Work (1981) and Smart Schools: From Training Memories to Educating Minds (1992). So when the Getty Center for Education in the Arts asked him to write about the link between thinking and art, he was pleased to be able to revisit his old avocation. The result was The Intelligent Eye.

"I try to find ways to weave these passions into whatever I'm doing," Perkins says. "They're like the supporting cast, even if they aren't the protagonists."

"The Intelligent Eye"

Perkins' theories about thinking are straightforward enough—90 percent of the time, he says, we really don't have to do too much of it.

That's because we run according to what's called experiential intelligence much of the time, he writes in The Intelligent Eye. This type of intelligence "is streamlined for fast, efficient responding," Perkins writes. "It relies on rapid automatic pattern recognition mechanisms to make sense of the inflow of information moment to moment."

Learning to use reflective thinking to explore art

David Perkins uses this woodcut from the Fogg Art Museum in The Intelligent Eye to illustrate the complex nature of artworks. The work has "initial invisibilities," Perkins writes—possible meanings that would not be seen without thoughtful looking. The figure in the extreme upper left, for instance, is a death's head, presumably beating a drum to call men to war. Some people realize it's a death's head immediately, while others don't. One interpretation sees all the figures engaged in the same action. Perkins writes, and another "highlights the contrasts" in the emotion of the figures—from the beatific to the agonized. Yet another interpretation sees the figures as a parade of冷却. The two farthest right are still angry posturing patriots, he writes, according to this reading of the work. "Ahead of them is the tortured face (eyes hidden) of one who has just been wounded. Ahead of him, center is the unconscious form of one dying. And farthest left, is a glasy-eyed soldier, presumably already dead."

Is there a correct answer about what the figures are doing? No; writes Perkins; but these contrasts remind us that puzzling over a work of art is a far cry from figuring out the one-and-only answer to a textbook algebra problem.
In order to navigate the drive home, for example, we really don't have to think about it, because we're operating under experiential intelligence. But what about that other 10 percent of the time—when, say, we are faced with a difficult math problem, or a sculpture by José Buescaglia? That's when we need reflective intelligence—the capacity to approach a problem for which we don't have a ready answer. Perkins, with his typical enthusiasm, offers four dispositions for looking at art:

1) Give looking time!
2) Make your looking broad and adventurous!
3) Make your looking clear and deep!
4) Make your looking organized!
And then he notes that these same dispositions can be applied to thinking.

By analyzing a complex work such as Käthe Kollwitz's *The Volunteers*, for example, we learn to appreciate nuances and layers of meaning. "... These contrasts remind us that puzzling over a work of art is a far cry from figuring out the one-and-only answer to a textbook algebra problem." Perkins writes. "Multiple interpretations are possible as we dig deeper and share readings with one another."

**Learning To Transfer**

Teaching people how to use reflective thinking, Perkins says, is fundamental to the future of education. One key to learning this problem-solving way of thinking is a concept called "transfer." Transfer refers to taking what one has learned in one context and putting it to use in another.

When Perkins, for example, is researching how people perceive patterns, he thinks not only about how artists perceive patterns, but also how astronomers look at patterns, and how physicians read X-rays.

"You miss things if you don't do that," he says.

The problem with our educational system is that transfer is not taught, because teachers assume it's happening. But only a very few people do it automatically—people whom Perkins calls "autonomous learners."

Most people don't think of transferring what they learn from one area to another, and so never do. It will take decades for the idea of teaching transfer to work its way into every schoolhouse, Perkins says, because educational reform happens slowly. Teachers typically have so much on their plates that it's hard for them to find time simply to devote to thinking about teaching.

But the idea will catch on eventually, Perkins believes, because it makes sense and it works. Perkins likens the teaching of reflective thinking to tennis lessons. The idea is not to make every person who takes lessons into a champion, he says, "but with instruction, people get better."

That's the idea that sparks Perkins to write books such as *The Intelligent Eye*. After all, if he can go from drawing monster pictures to writing books about the nature of intelligence, just think what a schoolchild of today may do with a little prodding.

*Copies of The Intelligent Eye can be purchased through the Getty Trust Distribution Center in Santa Monica, Calif., by calling 1-800-223-3431.*