Schools That Learn

A Fifth Discipline Fieldbook for Educators, Parents, and Everyone Who Cares About Education

A Fifth Discipline Resource
2. Mental Models

BECOMING MORE AWARE OF THE SOURCES OF OUR THINKING

Imagine that the baseball field near school is being regraded one day (courtesy of a donation from a local construction company), and the workmen strike a patch of stone with fossil footprints embedded in it. They’re dinosaur footprints. Excitedly, students gather around, to see a set of prints gradually uncovered—first the top third, then the middle, and then the bottom.

"What happened here?" asks one of the teachers. And all the children around the site immediately volunteer answers: The dinosaurs were fighting. No, they were friends, drinking from the same water hole. It was a courtship, with the male chasing the female... or the female chasing the male. A courtship? Hardly—clearly, one dinosaur ate the other. No, the smaller one flew away and survived ("See where it jumped off?"). No, it was literally swept off its feet by its larger dinosaur lover. Or perhaps a pterodactyl swooped down and carried it away... Or perhaps the whole juxtaposition was coincidence, and the footprints were left in the rock a few thousand years apart.

Try this exercise yourself, with a group of kids. You’ll find no shortage
of widely varying interpretations, and many participants will be convinced that their interpretation must be right. Indeed, human beings, perhaps unlike dinosaurs, are creatures of interpretation. Our behavior and our attitudes are shaped by the images, assumptions, and stories that we carry in our minds of ourselves, other people, institutions, and every aspect of the world.

Because mental models are usually tacit, existing below the level of awareness, they are often untested and unexamined. They are generally invisible to us—until we look for them. Thus, reading this passage, you may have easily noticed your interpretations of the dinosaur tracks, but you may not have reacted to other assumptions implicit in this passage: that the school can't afford to pay for its landscaping, that landscaping workers will probably be male, that the students play baseball (instead of, say, cricket), and that only children, as opposed to adults, will want to guess at the meaning of the dinosaur footprints.

Differences between mental models explain why two people can observe the same event and describe it differently: They are paying attention to different details. The core task of the discipline of mental models is bringing tacit assumptions and attitudes to the surface so people can explore and talk about their differences and misunderstandings with minimal defensiveness. This process is crucial for people who want to understand their world, or their school, more completely—because, like a pane of glass framing and subtly distorting our vision, our mental models determine what we see. In any new experience, most people are drawn to take in and remember only the information that reinforces their existing mental models.

Mental models thus limit people's ability to change. A group of superintendents and school board members may tacitly believe that the only way to improve the schools is to invest more money; therefore, they don't recognize other possible approaches. A teacher may assume that students from the "wrong side of the tracks" don't care about school, so he subtly dismisses them out of hand. An administrator may assume that the local teachers' union will block all innovation, so she approaches the unions defensively, holding back as much information as possible—which in turn makes the union leaders more defensive. The leaders of a school reform effort may assume, without even being fully aware of it, that parents don't really know much about their children's needs. Therefore, they inadvertently alienate parent groups, without ever understanding why. A forty-five-year-old laborer who never earned a high school diploma may assume that his children's teachers look down on
The techniques in this section emerged from "action science," a field of inquiry developed by the theorists and educators Chris Argyris and Donald Schön. Their work, in turn, is grounded in the "double-bind" theory of anthropologist Gregory Bateson and the semantic work of linguist S.I. Hayakawa. See The Fifth Discipline Fieldbook, p. 264, for more about the roots of this work, and The Age of Acies by Art Kleiner, p. 228ff, for the story of Chris Argyris's work. Also see Argyris, "Teaching Smart People How to Learn," in Harvard Business Review (May-June 1991, reprint #91301), and Overcoming Organizational Defenses (Needham Heights, MA: Allyn & Bacon, 1990).

him; he never summons the courage to come in to school for meetings, and the teachers assume he doesn’t care. A local community member may assume that, because many schoolteachers are women, they do not need to be paid as much—and vote down the school referendum. Though at first glance working with mental models may seem to be an intellectual exercise with little relevance to the "real world," it is probably the most practical of the five disciplines. It has direct relevance for a surprising number of seemingly intractable challenges in schools.

The consequences of untested and unsurfaced mental models can be tragic for children. Statistics suggest that bullying is a lifelong trait. A middle-school child who is recognized by teachers as a bully has a 69 percent chance of having a felony record as an adult. Is that because the teachers and administrators have a mental model of that child as a bully? Or because the child holds an unseen, unspoken mental model that bullying is the most effective way to solve problems?

The practice of "working with mental models" help us see the metaphorical pane of glass we look through and help us re-form the glass by creating new mental models that serve us better. Two types of skills are central to this practice: reflection (slowing down our thinking processes to become aware of how we form our mental models) and inquiry (holding conversations where we openly share views and develop knowledge about each other’s assumptions). There is an unwritten rule in many organizations, including many schools, that people should not ask questions unless they already have the answer to offer. The discipline of mental models flies in the face of that idea. People ask questions in the practice of this discipline because they are trying to learn more about their own, and each other’s, most deeply held attitudes and beliefs.

The ladder of inference

We live in a world of self-generating beliefs that remain largely untested. We adopt those beliefs because they are based on conclusions, which are inferred from what we observe, plus our past experience. Our ability to achieve the results we truly desire is eroded by our feelings that:

- Our beliefs are the truth.
- The truth is obvious.
- Our beliefs are based on real data.
- The data we select are the real data.
For example: I am a teacher presenting a proposed change in the science curriculum at a faculty meeting. Doris, an experienced teacher and department chair, sitting at the end of the table, seems bored out of her mind. She turns her dark, morose eyes away from me and puts her hand to her mouth. She doesn’t ask any questions until I’m almost done, when she breaks in: “I think we should wait until next year.” In this school, that typically means “Let’s forget about this and move on.” Everyone starts to shuffle papers and put notes away. Doris obviously thinks that I’m incompetent—which is a shame, because these ideas are exactly what she needs. Now that I think of it, she’s never liked my ideas. Clearly, Doris is a power-hungry jerk. By the time I take my seat, I’ve made a decision: I’m not going to propose anything again to any group that includes Doris. She will always use it against me. It’s too bad I have an enemy who’s so prominent in the school system.

During the course of this meeting, I have climbed up a mental “ladder of inference”—a common mental pathway of increasing abstraction, often leading to misguided beliefs:

- I started with the observable data: Doris’s comment, which is so self-evident that it would show up on a videotape recorder.
- I selected some details about Doris’s behavior: her glance away from me and apparent yawn. (I didn’t notice her listening intently one moment before.)
- I added some meanings of my own, based on the culture around me (that Doris wanted me to hurry up and finish).
- I moved rapidly up to assumptions about Doris’s current state. (She’s bored.)
- I concluded that Doris, in general, thinks I’m incompetent. In fact, I now believe that Doris (and probably everyone whom I associate with her) is opposed to me.

Thus, as I reach the top of the ladder, I’m plotting against her. It all seems so reasonable, and it happens so quickly, that I’m not even aware I’ve done it. Moreover, all the rungs of the ladder take place in my head. The only parts visible to anyone else are the directly observable data at the bottom and my own decision to take action at the top. The rest of the trip, the ladder where I spend most of my time, is unseen, unquestioned, not considered fit for discussion, and enormously abstract. (These leaps up the ladder are sometimes called “leaps of abstraction.”)

I’ve probably leapt up that ladder of inference many times before.
We've either got to find a way to motivate Jean or ask her to leave. Jean’s not really interested in working with us.

She’s probably been forced to show up, but she leaves as soon as she can.

She must not really be interested in the committee.

Jean, one of the teachers on our joint parent-teacher committee, left early today.

The more I believe that Doris dislikes me, the more I reinforce my tendency to notice her malevolent behavior in the future. This phenomenon is known as the “reflexive loop”: Our beliefs influence what data we select next time. And there is a counterpart reflexive loop in Doris’s mind: As she reacts to my strangely antagonistic behavior, she’s probably jumping up some rungs on her own ladder. For no apparent reason, before too long, we could find ourselves becoming bitter enemies.

Doris might indeed have been bored by my presentation—or she might have been eager to read the report on paper. She might think I’m incompetent, she might have other things on her mind, or she might be afraid to embarrass me. More likely than not, she has inferred that I think she’s incompetent. We can’t know, until we find a way to check our conclusions.

Unfortunately, assumptions and conclusions are particularly difficult to test. For instance, suppose I wanted to find out if Doris really thought I was incompetent. I would have to pull her aside and ask her, “Doris, do you think I’m an idiot?” Even if I could find a way to phrase the question, how could I believe the answer? Would I answer her honestly? No, I’d tell her I thought she was a terrific colleague and a fine teacher, while privately thinking worse of her.

Now imagine me, Doris, and three others on, say, a school curriculum committee, with our untested assumptions and beliefs. When we meet to deal with a concrete problem, the air is filled with misunderstandings, communication breakdowns, and feeble compromises. Thus, while our individual IQs average 140, our team has a collective IQ of 85.

You can’t live your life without adding meaning or drawing conclusions. It would be an inefficient, tedious way to live. But you can improve your communications through reflection and by using the ladder of inference. For instance, once Doris and I understand the concepts behind the ladder of inference, we have a safe way to stop a conversation in its tracks and ask several questions:

- What are the observable data behind that statement?
- Does everyone agree on what the data are?
- Can you run me through your reasoning?
- How did we get from that data to these abstract assumptions?

I can ask for data in an open-ended way: “Doris, what was your reaction to this presentation?” Or I can simply test the observable data by making a comment like this one: “You’ve been quiet, Doris.” To which
she might reply: “I’m taking notes; I think there’s a lot of potential here.”

Note that I don’t say “Doris, I think you’ve moved way up the ladder of inference. Here’s what you need to do to get down.” The point of this method is not to diagnose Doris’s attitude but to make our own thinking processes visible, to see what the differences are in our perceptions and what we have in common. (You might say, “I notice I’m moving up the ladder of inference, and maybe we all are. What are the data here?”)

The ladder can be used in staff development, in the classroom, and in a variety of school and community meetings. When teaching, for example, instead of letting arguments among students escalate, you can ask: “What did you actually hear or see that led you to this conclusion?”

3. Shared Vision

Fostering commitment to common purpose

A boy of five, on the first day of kindergarten, asked his teacher, “When am I going to learn to read?”

She said, a bit absently (for there was a lot going on), “Oh, that won’t happen until next year, in first grade.”

He didn’t say anything, but an hour or so later, she noticed that he had slipped away when no one was looking. He walked out of the room and continued home (which fortunately was only a few blocks away). He went up to his startled mother and said, “I’ll go back next year . . . when they’re ready to teach me to read.”
All people know what they want from education. The parent wants the child to be successful—or, perhaps, simply to learn to read. The teacher wants to create a terrific curriculum, encompassing not just intellectual skills but athletics, music, art, and socially adept behavior—or, perhaps, to have a high-performing class. The administration is concerned about meeting state mandates. And the child wants to learn—whether it’s to read right now, to dive off the high board, to build things, to play music, to make friends, or simply to be him- or herself.

The discipline of shared vision is the set of tools and techniques for bringing all of these disparate aspirations into alignment around the things people have in common—in this case, their connection to a school. In building shared vision, a group of people build a sense of commitment together. They develop images of “the future we want to create together,” along with the values that will be important in getting there and the goals they hope to achieve along the way. Without a sustained process for building shared vision, there is no way for a school to articulate its sense of purpose.

Unfortunately, many people still think that “vision” is the top leader’s job. In schools, the “vision” task generally falls to the superintendent, the principal, and the school board. Within a classroom, it may fall to a teacher. But visions based on authority are not sustainable. They may succeed in carrying a school or a school system through a crisis—“the superintendent wants us all to pull together to get through this budget crunch.” But when the crisis is over, people will fall apart, back to their fractionalized and disparate hopes and dreams. They will never know the potential that comes from creating a shared vision of what their school, their classroom, and their community might be.

Catalyzing people’s aspirations doesn’t happen by accident; it requires time, care, and strategy. To support this creative process, people need to know that they have real freedom to say what they want about purpose, meaning, and vision with no limits, encumbrances, or reprisals. School administrators and community leaders must put aside their fear that “we must set the limits within which people can create vision, or they will run out of control.”

Shared visions have a way of spreading through personal contact. To link multiple communities together, the school system depends on its informal networks—communication channels where people talk easily and freely, meeting at potluck suppers, participative events, and other informal gatherings. Electronic mail and computer conferencing can also support such networks. However, early experience suggests that
while computer networks can help people keep in touch and compare assumptions easily, they are not adequate for building shared meaning. As members of a community, we need to meet in person when we talk about what we really care about.

See shared vision processes for classrooms (page 175), or school and community (page 289). Also see Ed Joyner’s view of the Comer approach to shared vision (page 385).

4. Team Learning
Transforming our skills of collective thinking

At its core, team learning is a discipline of practices designed, over time, to get the people of a team thinking and acting together. The team members do not need to think alike—indeed, it’s unlikely that they ever will. But through regular practice, they can learn to be effective in concert.

Schools are rife with team activity. A classroom is a team of people who need one another to accomplish their mutual purpose: to develop competence together. As a team, the classroom thus implicitly includes people who are not thought of as being members: the writers of key books and resources used in the classroom, the staff whose work makes the classroom possible, the administrators who secure the resources and support it needs, and the parents whose participation gives the classroom some of its power. The core team, however, consists of the people who return to the classroom day after day: the teacher and students.

When you move up the nested systems into the school and community levels, teams conduct the bulk of work. Policies are set by an elected team known as the school board; the board, superintendent, and top administrators form a high-level administrative team. Curriculum teams, site teams, and staff development teams all set the tone for innovation in schools. There is also increasing interest in intramural teams—for example, the Danforth Foundation has initiated meetings among a national group of superintendents, who compare notes and build capabilities for organizational learning in their school systems. These capabilities have begun to filter out into their administrative teams; many of the school boards in the individual school systems have now begun to practice the skills of, say, working with mental models.