

Schools That Learn



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

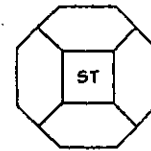
A Fifth Discipline Resource

administrators, parents, social workers, and community advocates. Everyone in the room had a powerful attitude, grounded in personal experience with people with disabilities, experience as teachers, and feelings about state budgets and state legislatures. Everyone spoke from the heart; everyone seemed to recognize the reasons why people had come to their views. The problem took on a meaning that it had not had before, as if the great possibility of special education itself hung in the air before the group. Nothing was resolved; no policies were decided on. But after these dialogues, the contentiousness of the issue seemed to disappear, as if people recognized that they had no choice but to approach this problem as members of one body. Later, in other meetings, decisions were made that resolved the question. People said they were far happier with the decisions than they would have been if dialogue had never taken place.

}} Also see *Productive Conversation*, page 153, and other examples of team learning practice
}} on pages 110, 395, and 406.

5. Systems Thinking

Developing awareness of complexity, interdependencies, change, and leverage



Most schools are drowning in events. It's amazing to sit in a superintendent's office and listen to incoming phone calls—and equally amazing, in a sense, that he or she doesn't unplug the phone. Each event seems to require an immediate response. A child is hurt on school grounds so an outside supervisor is assigned. A teacher's parent dies just before midterm reviews, and there is no qualified substitute, so the test is rescheduled. Each time, the superintendent (or another staff member) does a heroic job of fixing the problem: making the fastest possible diagnosis and finding the most immediate solution.

But there's a very real chance that each quick fix will do more harm than good in the long run. Moreover, reacting to each event quickly, and solving problems as quickly as they come up, helps develop a kind of "attention-deficit culture" in the school system. Moving rapidly from one issue to the next, people grow highly skilled at solving crises instead

of looking for ways to prevent them. In this type of culture, it's almost impossible to get people to speak openly and candidly about their mutual problems and concerns; those, after all, are "beside the point."

The discipline of systems thinking provides a different way of looking at problems and goals—not as isolated events but as components of larger structures. The superintendent's office, after all, is a system: composed of the habits and attitudes of the people who work there, the policies and procedures imposed by the state and the community, and such inplacable forces as available money and student population.

A system is any perceived whole whose elements "hang together" because they continually affect each other over time. The word "system" descends from the Greek verb *sunistanai*, which originally meant "to cause to stand together." As this origin suggests, the nature of a system includes the perception with which you, the observer, cause the system to stand together. Examples of systems (besides the superintendent's office) include biological organisms (including human bodies), the atmosphere, diseases, ecological niches, factories, chemical reactions, political entities, industries, families, teams—and all organizations. Within every school district, community, or classroom, there might be dozens of different systems worthy of notice: the governance process of the district, the impact of particular policies, the labor-management relationship, the curriculum development, the approaches to disciplining students, and the prevailing modes of staff behavior. Every child's life is a system. Every educational practice is a system.

The discipline of systems thinking is the study of system structure and behavior; it is enriched by a set of tools and techniques that have developed over the past thirty-five years, particularly since the advent of powerful computers. People who have experience with systems thinking can act with more effective leverage than a "short-attention-span culture" generally permits.



THE CONTINUUM OF "SYSTEMS THINKING"

The term "systems thinking" has been used, in the last two decades, to refer to a confusing array of tools, methods, and practices. *The Fifth Discipline* and *The Fifth Discipline Fieldbook* may have contributed to some of that confusion, by referring to "systems thinking" in inconsistent ways. There is, we now believe, a viable continuum of systems thinking practices, all with different



degrees of rigor, different approaches, and different views of the nature of a “system”:

- **“System-wide thinking”**: Efforts to enact change throughout an organization (like a school system) instead of in one narrow domain. For example, a superintendent may decide that curriculum projects and “School to Work” projects should work together, because, after all, “they are part of the same system.” System-wide thinking is generally more effective than working in isolation.
- **“Open systems thinking”**: Developed by thinkers such as Ludwig von Bertalanffy, Russell Ackoff, Eli Goldratt, and others, this school of systems thinking seeks to understand a system in terms of its inputs, outputs, throughputs, and boundaries.
- **“Human systems thinking”**: Thinkers such as David Kantor and Barry Oshry, for example, have proposed ways that people’s roles and relationships can interact, leading to results that no one would choose but that they cannot escape.
- **“Process systems thinking”**: Emerging through the quality movement and reengineering, this form of systems thinking sees an organization as a set of information flows. By realigning the communication structures, the patterns of behavior of the organization will change.
- **“Living systems thinking”**: Various forms of complexity and chaos theory, along with the theories of Humberto Maturana, David Bohm, and Lynn Margulis, suggest that emergent systems exist—that patterns of order will develop from chaos, much as life-forms develop.
- **“Feedback-related systems thinking”** or just “systems thinking” (sometimes called “system dynamics” or “systems thinking”): A wide array of techniques and tools that have developed out of an understanding of dynamic feedback processes (reinforcing and balancing loops). These tools include simulations, stock-and-flow diagrams, causal loops, system archetypes, and conversations about feedback.
- **“System dynamics simulation”**: The type of system analysis developed and championed by Jay Forrester and his colleagues, in which feedback interactions are represented by nonlinear mathematical equations. Since nonlinear equations describe accumulations and exponential growth, and since these equations are generally too complex for people to manipulate beyond a rudimentary level, system dynamics has depended on computer modeling and simulation.

We think all of these forms of systems thinking are appropriate

For more about the various kinds of systems thinking, see “Five Kinds of Systems Thinking,” by Charlotte Roberts, in *The Dance of Change*, p. 137. For an in-depth look at open systems theory and system dynamics, see George P. Richardson, *Feedback Thought in Social Science and Systems Theory* (Philadelphia: University of Pennsylvania Press, 1991). For the story of the evolution of system dynamics, see Jay Forrester, “The Beginning of System Dynamics,” banquet talk at the international meeting of the System Dynamics Society, Stuttgart, Germany, July 13, 1989, available at <http://sysdyn.mit.edu/people/jay-forrester.html>; and Art Kleiner, *The Age of Heretics* (New York: Doubleday, 1996), chapter 6.