Systems Theory

by Stephen Elliott-Buckley - Wednesday, April 14, 2010

http://politicsrespun.org/systems-theory-get-it/

From A Systems Perspective | Center for Ecoliteracy.

Systems thinking presents a different lens through which to understand the complexity of the world.

Thinking systemically entails a number of shifts in perception, which lead to different ways to teach, and to different ways to organize institutions and society. These shifts offer opportunities for teachers to present material in more holistic ways, in context rather than as isolated facts, consistent with the way students encounter the natural and social worlds in their own experience.

Systems thinking is one of the consequences of our guiding principle, “Nature Is Our Teacher,” discussed in the Explore section of the website. We note there that a systems approach helps young people understand the complexity of the world around them and encourages them to think in terms of relationships, connectedness, and context. We also highlight the shifts in perception that accompany systems thinking, and discuss their implications for educators.

These shifts are not either/or alternatives, but rather movements along a continuum:

From parts to the whole
With any system, the whole is different from the sum of the individual parts. By shifting focus from the parts to the whole, we can better grasp the connections between the different elements. Instead of asking students to copy pictures of the parts of a honeybee, an art teacher takes her class to the school garden. There they draw bees within the context of their natural setting.

Similarly, the nature and quality of what students learn is strongly affected by the culture of the whole school, not just the individual classroom. This shift can also mean moving from single-subject curricula to integrated curricula.

From objects to relationships
In systems, the relationships between individual parts may be more important than the parts. An ecosystem is not just a collection of species, but includes living things interacting with each other and their nonliving environment.

In the systems view, the “objects” of study are networks of relationships. In the school or classroom, this perspective emphasizes relationship-based processes such as cooperation and consensus.

From objective knowledge to contextual knowledge
Shifting focus from the parts to the whole implies shifting from analytical thinking to contextual thinking. This shift may result in schools focusing on project-based learning instead of prescriptive curricula. It also encourages teachers to be facilitators and fellow learners alongside students, rather than experts

dispensing knowledge.

From quantity to quality
Western science has often focused on things that can be measure and quantified. It has sometimes been implied that phenomena that can be measured and quantified are more important—and perhaps even that what cannot be measured and quantified doesn't exist at all.

Some aspects of systems, however, like the relationships in a food web, cannot be measured. Rather, they must be mapped. In the classroom, this shift can lead to more comprehensive forms of assessment than standardized tests.

From structure to process
Living systems develop and evolve. Understanding these systems requires a shift in focus from structure to processes such as evolution, renewal, and change.

In the classroom, this shift can mean that how students solve a problem is more important than getting the right answer. It may mean that the ways decisions are made is as important as the decisions.

From contents to patterns
Within systems, certain configurations of relationship appear again and again in patterns such as cycles and feedback loops. Understanding how a pattern works in one natural or social system helps us to understand other systems that manifest the same pattern.

For instance, understanding how flows of energy affect a natural ecosystem may illuminate how flows of information affect a social system.