

OUTLINE OF SYSTEMS INQUIRY

DEFINITION

- A reorientation of thought and world view that is expansionist, non-linear, dynamic, and synthetic (Analysis takes apart; synthesis puts together.)
- The whole is more than the sum of its parts, which are interrelation
- Systems – complexes of elements standing in interaction

HISTORY

- 1950s recognized a compelling need for a unified disciplined inquiry in understanding and dealing with complexities that are beyond a single discipline
- Pioneers are Bertalanffy and Boulding
- Started with engineers and scientists
- Deal with Man/Machine systems
- Cybernetics – concerned with self-organization of natural and artificial systems

GOAL

- To point out similarities in theoretical constructions of different disciplines to develop models that are applicable to different fields of study
- To develop “generalized ears” that overcome “specialized deafness” of specific disciplines
- To overcome the old view that the world consists of things by recognizing the primacy of organizing relationship processes between things

METHODOLOGY

- Identify the problem and its context
- Identify the system in which it is embedded
- Select tools and strategies appropriate to the system
- Non-linear, recursive and multi-directional

HUMAN SYSTEMS

- Nests of relationships sustained through time
- Depend on and contribute to their environment
- Are whole, but also part of larger systems and their constituents may be constituents of other systems
- Change is inevitable
- Adaptation is a response to something that evolved outside the system; thus evolution is an integral part of self-organization

5 TYPES OF HUMAN ACTIVITY SYSTEMS

- Rigidly controlled – Closed, simple structure, few elements, limited interaction such as an assembly line
- Deterministic – More closed than open, unitary, limited degree of freedom in selecting methods, such as bureaucracies
- Purposive – More open than closed, react to the environment, some freedom to select operational means and methods, such as corporations, public education systems
- Heuristic – Formulate their own goals and broad policy guidelines, somewhat pluralistic, open to change, complexity is dynamic, such as innovative business ventures, R & D agencies, alternative educational systems
- Purpose-seeking – Ideal seeking, guided by vision of the future, open and coevolved with the environment, pluralistic, such as cutting-edge R & D agencies

WORKING WITH SYSTEM PROBLEMS

- Factors assumed to be part of a problem are inseparably linked to other factors
- A system problem is really a cluster of problems
- Each apparent solution to a problem may aggravate or interfere with others
- Cannot be tackled using the linear or sequential method
- Ackoff suggests a set of interdependent problems is a “mess”

SYSTEM DESIGN

- Is a future-creative disciplined inquiry
- Seeks to create a system of interdependent and interacting solution ideas
- Need to formulate new purposes, introduce new functions, new components and new arrangement of components
- It is more a way of looking at a problem than it is problem solving
- Systemic (dynamic and interactive) not systematic (regular and methodical)

FOUR DOMAINS OF SYSTEMS DESIGNING IN EDUCATION

- Systems analysis and description of educational systems
- Systems design using models, methods and tools appropriate to education
- Implementation and institutionalization
- Systems management and the management of change

MODELS OF EDUCATION AS A SYSTEM

- Systems-Environment Model describes a system in the context of its community and the larger society
- Functions/Structure Model focuses attention goals and functions needed to attain the goals and their arrangement
- Process/Behavioral Model concentrates on the educational system through time and how it engages in transformation

PROCESS MODEL OF SOCIAL SYSTEM DESIGN

- Transcend the existing state
- Envision the system we wish to create
- Design based on the image
- Transform the system by developing and implementing the system based on the design (note the difference between ‘reform’ and ‘transform’)

Instructional Design is NOT systems design