

Models of Change and Implementation

Andrew H. Van de Ven, U. of Minnesota

Overview

- Conceptual models of change
- Factors influencing STEM adoption & implementation
- Breakdowns in managing change
 - Do you fix the organization to fit your model? or
 - Do you change your model to fit the organization?



WESTERN MICHIGAN UNIVERSITY

Facilitating Change in Undergraduate STEM

Invitational Symposium held June 16-19, 2008 at Brook Lodge in SW Michigan

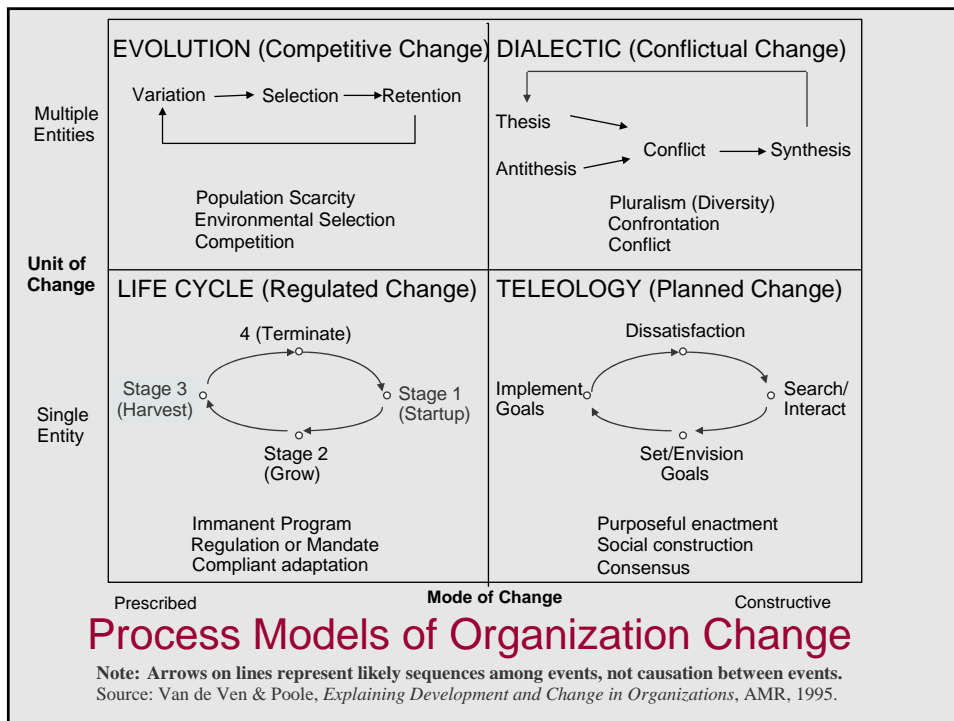
Henderson Typology of Change Categories

Aspect of System to Be changed: Individuals		
Intended Outcome: Prescribed	I. Developing: CURRICULUM & PEDAGOGY Change Process: Tell/Teach individuals about new teaching conceptions and/or practices and encourage use. Examples: dissemination/training (SER, FDR), focused conceptual change (FDR) (30% of articles)	Intended Outcome: Emergent
	II. Developing: REFLECTIVE TEACHERS Change Process: Encourage/Support individuals to develop new teaching conceptions and/or practices. Examples: reflective practice (FDR), curriculum development (SER), action research (31% of articles)	
Intended Outcome: Prescribed	III. Developing: POLICY Change Process: Develop new environmental features that Require/Encourage new teaching conceptions and/or practices. Examples: policy change (HER), strategic planning (HER) (14% of articles)	Intended Outcome: Emergent
	IV. Developing: SHARED VISION Change Process: Empower/Support stakeholders to collectively develop new environmental features that support new teaching conceptions and/or practices. Examples: institutional transformation (HER), learning organizations (HER) (5% of articles)	
Aspect of System to Be changed: Environments and Structures		

Source: Henderson, Preliminary Categorization of Literature Promoting Change in Undergraduate STEM, 6-3-08

Questions about facilitating change In undergraduate STEM

1. What model of change in STEM do you have in mind?
2. How does the process of change unfold in your model?
3. What breakdowns are you experiencing in implementing your model?



Example of Planned Change: Kotter Model

1. Establish a sense of urgency
2. Form a powerful guiding coalition to work as a team
3. Create a goal or vision to direct the change effort
4. Communicate the new vision to people
5. Empower others to act on the vision & get rid of obstacles
6. Plan/create short-term wins or performance improvements
7. Consolidate & continue improvements by hiring, promoting & developing employees who implement the vision
8. Institutionalize the change by showing the connections between new behaviors and corporate success.

Source: John P. Kotter, *Leading Change: Why Transformation Efforts Fail*, *Harvard Business Review*, 1995, pp. 59-67.

Example of Life Cycle Stage-Gate Process

Stage-Gate® Product Innovation Process



Example of Dialectical Model: Schon's Political Model of Public Policy

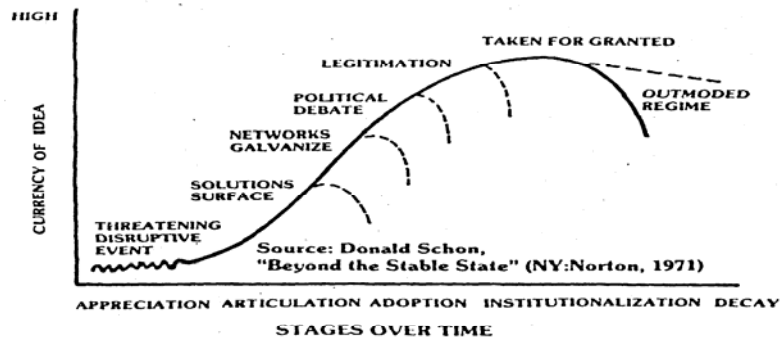


FIGURE 1. Managing Life Cycle of Ideas in Good Currency.

Example of Evolutionary Change: Miner's Model of Evolutionary Change

<i>Variation</i>	<i>Selection</i>	<i>Retention</i>
1. Institutionalized experimentation a. Research and development b. Champion and entrepreneurial roles c. Some total quality experiments d. Parallel projects	1. Goals	1. Active controls a. Budgets b. Information systems c. Audits
2. Direct and indirect incentives a. Innovation norms b. Professional individual incentives c. Material individual incentives value d. Equity interests	2. Values	2. Formalization a. Rules b. Job descriptions c. Procedures d. Research protocols
3. Playfulness a. Informality b. Skunkworks c. Slack resources	3. Project criteria	3. Social values
	4. Project checkpoints	
	5. Competition a. Shoot-outs b. Managerial competition for resources	



STEM Example of Evolutionary Change: First Robotics Competition

Vision

"To transform our culture by creating a world where science and technology are celebrated and where young people dream of becoming science and technology heroes." Dean Kamen, Founder

2008 FIRST Robotics Competition

- 1,501 teams
- 37,525 high-school students
- From Brazil, Canada, Chile, Israel, Mexico, the Netherlands, the U.K., and every state
- 41 Regional events in Brazil, Canada, Israel, U.S.
- FIRST Robotics Competition Championship in Atlanta, GA, April 17-19, 2008
- Robots are built in 6 weeks from a common kit of parts provided by FIRST

	Teleology Planned Change	Life Cycle Regulated Change	Dialectic Conflictual Change	Evolution Competitive Change
Process	Dissatisfaction, search, goal setting, & implementation	prescribed sequence of steps or stages of development	Confrontation, conflict & synthesis between opposing interests	Variation, selection & retention among competing units
Triggers	Goal, opportunity or threat	Prefigured program regulated by nature, logic or rules	Conflict between opposing forces	Competition for scarce resources
Key metaphor	Purposeful cooperation	Organic growth	Opposition, conflict	Competitive survival
Process failures	Decision Biases, Lack of consensus, Group think	Resistance to change, noncompliance, Monitoring & control	Destructive conflict, Irresolvable differences	Requisite variety, Lack of scarcity
Process remedies	Critical thinking, Rational decisions, Consensus building	Obtaining 'buy in', Internalizing mandates	Negotiation skills, Partisan mutual adjustment	Strategies for competitive advantage
Examples	Rational choice models	Legislated change programs	Political action models of change & protest	Evolutionary models of competition

Resistance to Change

People Resist Change when the Change:

1. is not understood => provide trial demonstrations
2. costs outweigh benefits => make evidence-based case
3. is imposed or threatening => encourage local reinvention
4. incompatible with arrangements => align structures & incentives
5. bogs down => need process facilitators & leadership support
6. process wanders => structure events, deadlines to maintain attention

People are more likely to implement their own innovations than someone else's. Positive intentions may motivate negative responses to change. View resistance as constructive suggestions for (not against) change.

Sources: S. Piderit, *Rethinking Resistance and Recognizing Ambivalence...* AMR, 2000.

A. Van de Ven, H. Angle, & M. Poole, *Research on the Management of Innovation: The Minnesota Studies*. NY: Harper&Row, 1989; reprinted Oxford U. Press, 2000.

People are more likely to Comply with Requests to Adopt Innovations When:

1. A reason is provided for the request
2. Reciprocity exists: provide an initial gift before making request
3. Small initial commitment is made, then rely on consistency
4. Social proof exists that many similar others are complying
5. Request comes from individual they know and like
6. Request comes from legitimate authority
7. The opportunity is scarce, limited, or difficult to attain

Modern life creates cognitive overload because of technical advances, burgeoning information, expanding choices and opportunities, and exploding knowledge. People use decision shortcuts by relying on simple triggers for compliance. The most reliable triggers are commitments, opportunities for reciprocation, the compliant behavior of similar others, feelings of liking or friendship, authority directives, and scarcity information.

Robert B. Cialdini, *Influence: Science and Practice*, 3rd Ed. NY: HarperCollins, 1993.

Innovation Characteristics That Influence Its Adoption

1. Relative advantage based on objective evidence,
2. Compatibility with existing practices,
3. Ease of understanding - not complex,
4. Observable to see how it works
5. Trialability and Adaptability to fit local needs.

Source: Everett Rogers, Communication of Innovations, 2003

Organizational Factors Influencing Adoption

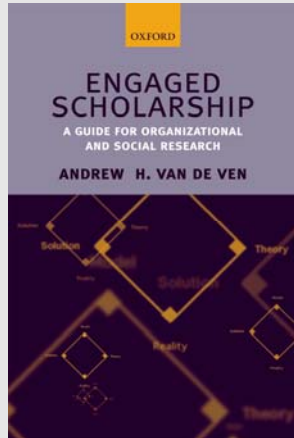
Organization Characteristics:

- Resources – money, motivation, momentum
- Ability – training & competence
- Open cross-boundary communications
- Organizational network & supportive infrastructure
- Political processes to push ideas into good currency

Organizational Situations: Adoption more difficult when:

- Decision unit is a complex organization vs. an individual
- Change is implemented in depth vs. in breadth
- Change is externally mandated vs. locally chosen to fit situations,
- System is pluralistic with different mental models for organizing.

Does STEM Scholarship Influence its Adoption?



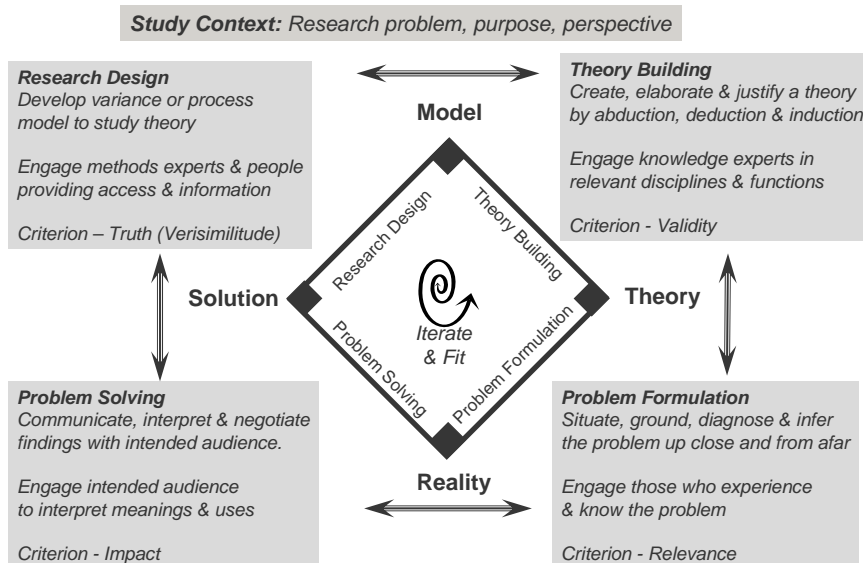
Oxford Univ. Press, 2007

Central Claim:

We can increase the likelihood of advancing and implementing research knowledge by engaging key stakeholders in four steps of a study:

1. Ground problem/question in reality up close & from afar.
2. Develop alternative theories to address the question.
3. Collect evidence to compare models of theories.
4. Communicate & apply findings to address the problem/question.

Engaged Scholarship Diamond Model



Source: A. Van de Ven, *Engaged Scholarship*, Oxford Univ. Press, 2007

Alternative Forms of Engaged Scholarship

Research Question/Purpose

		Research Question/Purpose	
		To Describe/Explain	To Design/Intervene
Research Perspective	Detached Outside	Basic Science With Stakeholder Advice 1	Policy/Design Science Evaluation Research For Professional Practice 3
	Attached Inside	Co-Produce Knowledge With Collaborators 2	Action/Intervention Research For a Client 4

Your thoughts, please



1. What model of change do you have in mind?
2. Do your steps consider the factors that influence innovation adoption and implementation?
3. Does your STEM research & teaching influence its adoption and implementation?
4. What breakdowns are you experiencing in implementing your model?
5. When change does not unfold as expected:
 - Do you change the organization to fit your model? or
 - Do you change your model to fit the organization?

Thank You!
avandev@umn.edu