

Complexity Science and Analysis of Health Care Delivery Systems

By Reuben R. McDaniel, Jr.

Charles and Elizabeth Prothro
Regents Chair
McCombs School of Business

Introduction

- Getting started.
- Using complexity science as a theoretical framework.
- When you have a hammer everything looks like a nail.

A Fundamental Question

- What do health care organizations look like and how do they work if one recognizes that they are complex adaptive systems?

Implications for health care management

- Make sense and develop collective mind
- Deal with surprise
- Pay attention
- Take action
- Think about the future
- Learn in real time
- Pay attention to designing as a verb
- Enhance the quality of connections
- Utilize self-organization
- Give up planning and control

Turnarounds, mergers and acquisitions in health care delivery systems

- Role of professional expertise and values
- Small causes can have big effects
- Connections, relationships and interdependencies

Role of professionals in health care organizations

- Relationship building
- Loose coupling
- Complicating
- Diversifying
- Sense making
- Learning
- Improvising
- Thinking about the future

Diversity in organizations

- Traditional view
 - Provide justice
 - Respond to environment
 - A problem to be solved
- Complexity science view
 - *Developing and maintaining a complex set of relationships*
 - *Learning in real time*
 - *A strategic resource*

Participation as an approach to managing connections

- RN and MD participation in decision-making
- RN and MD influence varied across decision content and decision level
- Compare the effect of participation of middle managers and clinicians

***Performance improved for
clinical outcomes as well as
financial outcomes in both
hospital and nursing home
settings***

***Participation is a simple rule to
complexify organizations
and
Complexification leads to better
performance***

Response strategies of nursing homes to complexity are related to organizational performance.

- Connection between managerial practices and resident outcomes
- Related to a variety of performance measures
 - client outcomes
 - financial outcomes
 - employee turnover

Increased communication and interaction
improves performance

Reliance on authoritarian strategies
decreases performance.

Virtual collaborations and trust – A Study of the Use of Telemedicine

- Investigated both technical and motivational issues
- Dynamics of trust in relationships between clinicians
- *The trust relationship is a major determinate of telemedicine project success.*

Understanding the organization of primary care practices

- Trying to understand change in primary care practices
- Consistent with complexity science, successful primary care practices are organized in ways similar to jazz ensembles

Insights from complexity science

- People are not stupid. The fundamental intellectual schema that they use to understand the world is inconsistent with complexity science.

Life is Really Interesting

We wake up in the morning and we do not know what we are doing.

Everybody knows that we do not know what we are doing.

Complexity science is a way of thinking about the world that enables us to be effective participants in life anyway.

- Traps in research and practice
 - Dynamic
 - Nonlinear
 - Patterns
- Promising observational tools
 - Multiple-Method Case Studies
 - Agent-based models
 - Computer Simulations
- Promising theoretical tools
 - Social network theory
 - Evolutional theory
 - Small worlds

A program of applications **driven research**

- Using complexity science as a theoretical framework to organize inquiry
- Remember, when you have a hammer everything looks like a nail